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On Abduction, Deduction, Induction and the Categories

Can we say something about Charles Peirce's abduction in relation to his categories? I will suggest that for an accurate understanding of abduction it is necessary to look at its interconnectedness with deduction and induction, which at least do not sound as unfamiliar as abduction but, as will be made clear, did receive a comparably unfamiliar explanation by Peirce. The interrelationship of these three forms of reasoning in Peircean thought can be described with the help of Peirce's categories. At least that seems an appropriate idea since it was exactly with Firstness, Secondness, and Thirdness as the most abstract typification of, respectively, iconic, indexical, and symbolic sign relations that Peirce himself explained the interrelatedness of some of his semiotic terminology. In general I would like to suggest that Peirce's categories are the key for several of his series of neologisms. Especially sign typologies have been gathered together by Peirce interpreters in schemas of First-, Second-, and Thirdness. Interestingly enough, in the *Collected Papers* such schemas can hardly be found; nonetheless. I think they usually are concise and clarifying. Here, I want to discuss a similar schema for Peirce's forms of reasoning in order to increase our insight in abduction. The composition of such a schema depends on a decision in a problem of sequence: out of the six different ways of distributing the three forms of reasoning over the categories only one can be chosen. To make a well considered selection one must be able to answer at least the following questions:

a) Is it possible at all to connect the categories Firstness, Sec-

ondness, and Thirdness to the three ways of reasoning: deduction, induction, and abduction?

b) Can we start with the attribution of a category to the case of abduction, the neologism that will forever be connected to Peirce?

c) And, of course in relation to the first two questions, is it possible to use the two remaining categories for deduction and induction in case the application of a category to abduction appears unproblematic?

Let me try to answer these questions provisionally but quickly so that I can delimit the six alternatives and focus on more subtle argumentations for selection. A short answer to the first question is: Yes, because Peirce claims universality for the categories. If the categories can be applied to all classificatory divisions, why should we refrain from doing so in case of the ways of reasoning? My answer to the second question would require our apprehension of Firstness, which is 'in fact' impossible for it would entail the actualization of a potentiality. In apprehending Firstness one would actualize a quality into an apprehension of that quality—which then of course has become a fact rather than a quality. Clearly, the term 'quality' is an apprehension already, but let's settle for it so that this term suggested as the correlative of the hypothetical nature of abductive reasoning's conclusion—in abduction we conclude what might be 'the case'—snugly fits the attribution of Firstness to abduction. Unfortunately, I cannot be as brief with respect to the answer to third question. Indeed, my problems with this answer will urge the reconsideration of the first two; they will induce the reiteration of the questions and a reformulation of the answers.

Peirce's *Collected Papers* are quite clear about the categorical status of abduction, but over against the distinctness about the Firstness of abduction there is the opacity of the status of deduction and induction. The issue is, so it seems, that in some places one can find deduction presented as the Secondness-form of reasoning and induction, *casu quo* as Thirdness, but elsewhere

Peirce typifies induction as Second and deduction as Third. In his 1903 lectures on Pragmaticism one can find the following confession regarding this incongruity: "Concerning the relation of these three modes of inference to the categories [. . .] my opinions, I confess, have wavered" (CP 5.146, 1903).

Still, if we depart from the acceptability of abduction's First-ness, we are able to narrow down the six possible sequences to two of immediate relevance. Apparently, our choice for a successive categorical sequence is either 'abduction, induction, deduction' or 'abduction, deduction, induction'. Now, as one could argue, a viable choice depends on the perspective from which the issue is addressed. As for the conclusion of the inferences, the succession 'abduction, induction, deduction' is one of increasing certainty—and simultaneously decreasing 'uberty'. Another perspective would be that of the theory of inquiry. In that case 'abduction, deduction, induction' would reflect the following succession: first the suggestion of a hypothesis, then the subsequent formulation of the consequences of the acceptance of such a hypothesis and, thirdly, the testing of these consequences so that new or more precise hypotheses can be suggested—obviously resulting in another three-phase inquiry. However, as for now, it remains to be seen whether or not either one of these perspectives has a specific relation to a categorical succession, especially with regard to the Second- and Thirdness respectively of induction and deduction in case of conclusive certainties, and of deduction and induction in case of the theory of inquiry.

I will argue that the best presentation of categorical sequence is 'abduction, deduction, induction' as First-, Second-, and Thirdness, indeed under the condition of taking the second, i.e. methodological perspective. However, to take this perspective of the theory of inquiry is again preconditioned in so far as one should show that only Peirce's descriptions of 'reality' as that 'which would be true in the long run of experience' will make possible the consideration of the methodological perspective to begin with. In other words, only with respect to such a view of

'reality', can 'abduction', 'deduction', 'induction' in this order be argued for as being the correct representation of the categorical sequence. At the same time of the introduction of this anti-nominalistic description of reality, Peirce no longer meant to address syllogistic forms of reasoning consisting in a tripartite division with variously placed 'case', 'rule', and 'result', but instead presented a methodology (cf. Burks 301-3; Fisch 336; Thagard 273; CP 2.102, 1902)

However, as suggested earlier, in secondary sources there is no consensus on categorical attributions to induction and deduction. Let me give some examples to illustrate how diametrically opposed opinions are:

> Da nun die Deduktion als rein logische Vermittlung nur die Drittheit, Induktion als quantittive Wertung des Bestätigungsgrades durch erfolgreiche Begegnungen mit den Tatsachen primär die Zweiheit zur Geltung bringt, so mußte die Erstheit der Ehrfahrung in erster Linie durch eine Neuinterpretation der Abduktion zur Geltung gebracht werden. (Apel 299)

> Die [...] Induktion [...] begründet als empirische Schlußweise die Realitätsthematik [...] der Zweiheit. [...] Die [...] Deduktion begründet als formale Schlußweise die Realitätsthematik [...] der Drittheit. (Bense 395)

> Induction [...] is of the order of observational experience [...]; this strategy of knowledge corresponds to Second-ness [...]. Deduction is of the order of thought [...]; this corresponds to Thirdness. (Parret 27)

Apel, Bense and Parret agree: abduction should be seen as the Firstness form of reasoning and, interestingly enough, induction and deduction as the Second- and Thirdness form respectively.

Notably, in American and Italian Peirce-research the following, different opinions can be heard.

> Thus, induction provides us with the habitual element in thought, or the [...] category of Thirdness; hypothesis, with the sensuous element, or Firstness; and deduction, with the routinal element, or Secondness. (O'Donnell 63)

> In deduction [...] once the premisses have been accepted, the conclusion imposes itself, making its acceptance compulsory. We are dealing with [...] the category of Secondness [...]. In induction [...] the conclusion is not imposed by the premiss and is susceptible to modification [...]. Here the category of mediation or Thirdness [...] dominates. (Ponzio 269-71; cf. Nesher 204)

The difference of opinion is clear: unlike the three authors mentioned earlier, O'Donnell and Ponzio indicate the Second- and Thirdness of deduction and induction respectively. All agree on the Firstness of abduction.

Peirce himself, as quoted, did not consider his presentation of the categorical status of the forms of reasoning as consistent. And indeed, when we compare "On a New List of Categories" (CP 1.545 ff, 1867) with his "Partial Synopsis of a Proposed Work in Logic" (CP 2.79 ff, 1902), even Peirce's own views seem diametrically opposed:

> In deductive argument, the conclusion is represented by the premiss as by a general sign under which it is contained [...]. In hypothesis, something *like* the conclusion is proved, that is, the premisses form a likeness of the conclusion [...]. [In] induction [...] the premisses are an index of the conclusion. (CP 1.559, 1867)

This particular account of the three forms of reasoning needs some interpretation before an attribution of categories can be made. Starting with the final remark in the quote: an index must

be taken as a sign-relation with the character of Secondness. In this case, therefore, we can relate induction to Secondness. Additionally, the 'likeness' of hypothesis must be seen as indicating its Firstness and the expression 'a general sign' is an indication of deduction's Thirdness. Hence, Peirce's account of abduction, induction, and deduction must respectively be understood as First-, Second-, and Thirdness. The following fragment, however, is different:

> [In] an Obsistent Argument, or *Deduction*, [...] the conclusion is drawn in acknowledgement that the facts stated in the Premiss constitute an Index of the fact which it is thus compelled to acknowledge. [...] Deduction is Obsistent in respect to being the only kind of argument which is compulsive. [...]. An Abduction is Originary in respect to being the only kind of argument which starts a new idea. A Transuasive Argument, or *Induction*, [...] is transuasive [...] in respect to its alone affording us a reasonable assurance of ampliation of our positive knowledge. (CP 2.96, 1902)

In Peirce's "Partial Synopsis" Originality, Obsistence, and Transuasion are names for, respectively, First-, Second-, and Thirdness, so that in this case it's fairly easy to understand the categorical status of the forms of reasoning: abduction must still be seen as the Firstness-form, but deduction and induction must now be attributed Secondness and Thirdness.

A stalemate seems unavoidable. Paradoxically, however, I think there is a solution, which concerns yet that attribution about which opinions appear not to differ: abduction's Firstness. Notably, it is not abduction's categorical status but rather the argumentation leading up to this attribution that needs some reconsideration. I see no objection to the thought that Peirce must have seen abduction as a firstness form, but what I consider to be the strongest argument in support of this has not been given very often, for it takes as point of departure Peirce's claim that "the

question of pragmatism [...] is nothing else than the question of the logic of abduction" (CP 5.196, 1903).

Abduction should not be understood in relation to the syllogistic format of the formulation of an hypothesis but rather in relation to Peirce's pragmatism and to the methodological range of the view that pragmatism concurs with the logic of abduction. The concurrence is found in answer to questions asked in both pragmatism and the logic of abduction; these answers concern science. The answer to the question 'What is pragmatism?', subsequently 'What is the logic of abduction?' is the same in both cases, namely: 'a theory of inquiry'. This theory entails the succession in science of abduction, deduction, and induction and, moreover, a description of modes of reality in terms of 'can-be's', 'existents' and 'would-be's' respectively.

In this perspective 'reality' should be expressed in 'would-be' terms (Thirdness) containing both 'real existence' (Secondness) and 'real possibility' (Firstness). Any other theory in which 'will-be's' represent 'reality', as in: 'reality is that which will be (true)', for Peirce is nominalistic and hence unacceptable. In Peirce's later work especially, we can see that whenever will-be's are introduced as categorical descriptions they concern Secondness:

> the *will-be's*, the *actually is's*, and the *have been's* are not the sum of the reals. They cover only actuality. There are besides *would-be's* and *can-be's* that are real. (CP 8.216, c. 1910; cf. CP 6.485, 1908)

In what follows I will take as my point of departure the relation between abduction and pragmatism in order to break the stalemate and suggest an explanation for apparently diverging opinions. This means that I will consider the theory of inquiry as the proper context for an understanding of abduction, because I hold the theory of inquiry to be Peirce's expression of the relation between abduction and pragmatism. On this basis I would like to suggest that Thirdness is not deduction's category, nor is it immediately that of induction, it rather refers to 'reality' as a whole

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and, therefore, to (scientific) inquiry as a whole, that is, to the completeness of abduction, deduction, and induction taken together. Abduction and deduction are respectively First- and Secondness abstractions from induction which, in the would-be mode of reality, presents an indefinite conclusion to a chain of reasoning. This suggestion can be enhanced by pointing out the epistemological consequences of Peirce's theory of inquiry. Knowledge can no longer be seen as a set of true propositions, it must be taken as a process; Peirce's epistemology is dynamic. Of course, it is still not clear what process is actually meant, since two processes can be thought of within Peircean theory. The first that comes to mind is: 'semiosis', the process of meaning (re)presentation; the second: the very process of scientific inquiry itself. Notably, however, the alternatives are not that different, indeed they are in a way identical.

Here, I will not elaborate on this identity but rather focus on the relation between epistemology and methodology—the theory of scientific inquiry. We've already seen the context of inquiry determining abduction, deduction, and induction as the sequential phases of inquiry, now we can also consider this sequence to be the representation of the process of—the growth of—knowledge. The forms of reasoning can, obviously, no longer be seen as syllogistic representations of analytical reasoning (deduction) on the one hand and synthetic reasoning (abduction and induction) on the other. The perspective of analytic versus synthetic has been the context of differing certainties determining abduction-induction-deduction in this order as a categorical sequence. In view of Peirce's later work, however, the context of increasing certainty has lost its appeal; strict logic does not suffice for a proper understanding of the interrelationship between forms of reasoning and the theory of inquiry. In the next fragment Max Fisch calls attention to this change in Peirce's point of view:

> So long as his focus was on the classification of arguments, Peirce set the logic of mathematics (that is, of deduction) over against the logic of science (that is, of hy-

pothesis and induction). But in his later years, his focus shifted from the classification of the forms of inference to the functioning of inferences, of the several forms in successive stages of inquiry. The order of the forms then became: hypothesis (abduction or retroduction), deduction, and induction. (Fisch 392)

These changes in Peirce's work occurred in the early nineties of the nineteenth century, and they are particularly relevant for the context in which abduction, deduction, and induction are determined in the categorical sequence of First-, Second-, and Thirdness. In short, Peirce no longer treated logic as a strict discipline and emphasized its methodological purport. From then on, logic no longer was a closed system with a truth-conditional essence but itself a dynamic process of—scientific—inquiry with a semiotic essence (cf. Anderson 21; Fann 59; Tursman 17).

Abduction and induction both concern the field of scientific inquiry. They are forms of reasoning that represent the logical—Peirce emphasized such—realm of can-be's and would-be's and, therefore, of First- and Thirdness respectively (cf. CP 8.236-8, c.1910). Precisely these different realms determine Peirce's theory of inquiry as dynamic, for they make it possible to give an account of methodology in other than strictly logical terms. Remarkably, Peirce still claimed logicality for his methodology but because of his broad conception of logic it made all the difference to think through methodology other than *strictly* logical; Peirce insisted that scientific inquiry also concerns assessments of a non-truth conditional purport. In other words, inquiry is not limited to analytic reasoning and is, therefore, not restricted to deduction. Peirce's methodology entails a range of meaningful claims which can be not only scientifically determined but also logical and unverifiable at the same time. This holds for truth-claims which as 'real-*probabilities*' are expressed in 'would-be' terms (i.e. Thirdness) and for 'real-*possibilities*' expressed in 'can-be's' (Firstness) (cf. CP 5.194, 1903).

Apparently, there is only one form of reasoning fit to encompass the whole range of reasoned reality claims: it is called induction. The choice is induction because it is the most complete form of reasoning and as such results in general statements about the future of 'a long run of experience' in a non-predetermined community of inquirers; other forms of reasoning are in fact abstractions from this most complete one. For example, we can focus on just one aspect of a community's inquiries and emphasize the one phase of inquiry in which real possibilities are addressed. In that case we are focusing on the form of reasoning, namely abduction, that brings forth certain qualifications better known as hypotheses. The deductive phase of inquiry, in which the consequences suggested by an abduction's hypotheses are made explicit, is methodologically closer to induction—the third phase in which inquiry is completed by testing these explicitly formulated consequences of a hypothesis. If induction in its completion of inquiry is understood as the most complete representation of the theory of inquiry, from which deduction and abduction are abstracted phases, then the categorical predicate Thirdness best fits induction. For Thirdness encompasses Secondness which in turn encompasses Firstness, just like induction encompasses deduction encompassing abduction. Categorically, therefore, deduction is Second- and abduction First. In this way it has indeed been possible to argue for the categorical status of abduction, deduction, induction in terms of Peirce's theory of inquiry.

Still, the stalemate is not resolved completely. What remains is an explanation of the possibility to differ on deduction and induction's categorical predication. But, to decide on the Second- or Thirdness of deduction and induction, curiously enough, depends more on abduction's category. Recall that this is in fact strange because on the Firstness of abduction no one seems to disagree.

Now, it's important to understand that only in a theory of inquiry in which the 'reality of possibility' and the reality of the 'would-be true' are interrelated, can abduction be discriminated from deduction and, more significantly, from induction. Hence,

only in Peirce's later work, i.e. later than 1896, can we identify his pragmatism with a theory of inquiry; which identification made it possible to discriminate forms of reasoning methodologically to begin with. The year 1896 is found to be methodologically relevant by Max Fisch:

> [Peirce] remained a nominalist [...] until late 1896, when he repudiated 'the nominalistic view of possibility', and explicitly 'returned' to the Aristotelian doctrine of *real possibility*. (368; cf. 184-200 esp. 189 and 194)[1]

Although abduction, deduction, and induction do occur in Peircean texts written earlier than 1896, a proper understanding of abduction nevertheless requires its methodological description. If now, additionally, we accept that complete Thirdness (reality) requires the inclusion in it of Secondness (actuality) and Firstness (possibility), then evidently the categorical assessment of the forms of reasoning cannot be situated before 1896. In other words, as long as only deduction and induction are discerned, any description in terms of the categories of such an incomplete account of reasoning is possible but at the same time arbitrary. Before 1896 any categorical status of the forms of reasoning would be as plausible as premature, which implies that a difference of opinion concerning pre-1896 category descriptions is meaningless.

I want to conclude by readdressing the issues phrased as three questions in my introduction. Is it possible to give categorical descriptions of the forms of reasoning? I still think that such an assessment should be possible with regard to Peirce's universality-claim; however, one should remark that to describe only two really discriminated forms with three categories will unavoidably be arbitrary. The categorical status of forms of reasoning that cannot be described discriminately themselves does not contribute to reasoning's understanding. Consequently the second question: 'Is abduction a Firstness form?' can only get a meaningful answer if

this form is methodologically distinguished from deduction and induction. Not until late 1896 did Peirce's work contain a theory of three-phased inquiry allowing the meaningful attribution of Firstness to abduction.

Finally, do we have to ascribe Second- and Thirdness to deduction and induction respectively? From the perspective of Peirce's theory of inquiry we should attribute the 'would-be-category', Thirdness, to the most complete representation of inquiry: the representation of induction, deduction, and abduction taken together. Since we must understand induction as that form of reasoning which encompasses as preceding phases of inquiry the other forms of reasoning, namely deduction and abduction, we indeed can see induction as Thirdness. To think through what it is that establishes deduction as a phase of inquiry, we would have to abstract from the complete representation, i.e. from the Thirdness of induction, so that we arrive at the actualization of abduction's implications. We therefore have to ascribe Secondness to deduction. From late 1896 onwards, then, there is no doubt about abduction's Firstness. My conclusion, now more firm, is that in this way I have argued for a categorical sequence in phases of inquiry so as to assess the First-, Second-, and Thirdness of abduction, deduction, and induction respectively.

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NOTE

1.   Fisch is most precise on page 194: "in October 1896 he still held to the nominalistic definition of possibility [...] in January 1897, he renounced it".

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