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Categories, Diagrams, Schemata

The cognitive grasping of ideal objects in Husserl and Peirce

Diagram experimentation forms the prototype of the various transformation concepts encountered in different semiotic theories. Diagrams are, as we saw, types, or ideal objects – and they may be used to refer, in turn, to other general, ideal objects. A theoretical tradition with emphasis on the access to ideal objects is Husserlian phenomenology. Husserl's conceptions of abstraction and *kategoriale Anschauung* – categorial intuition - was first developed in his early work and played an important role in *Logische Untersuchungen*[i] and later in *Erfahrung und Urteil* and elsewhere. Here, the grasping of ideal objects pertains not only to mathematics and logic - even if they form an important case - rather, it forms a crucial parts of everyday cognition in so far as most cognitive acts are not simple and involve general elements in what Husserl calls "sinnlich gemisschte", sensuously mixed form.

In this chapter, we shall outline the early Husserl's theory of access to ideal objects with the aim of comparing and integrating it with Peirce's diagram doctrines.

Unbelievable but true

It is a strange fact that so little comparison between Husserl and Peirce has been undertaken.[ii] Probably the historical reason is that the two philosophers both stand on the initial edge of the analytical/continental split and ended up as founding fathers for each their main currents in philosophy – phenomenology and pragmatism/semiotics, respectively. Seemingly rooted in each their specific tradition, the large bulk of common ideas and interests

in their works have been ignored. Distorted parodies of the two - Husserl the transcendental solipsist, Peirce the pan-semiotician - have added to preclude a closer *Auseinandersetzung* between the two.

Correspondingly, it is little known fact that the two of them *did* in fact know the other's work - albeit not, unfortunately, to a degree sufficient to reveal the crucial convergences to any of them. Husserl's interest in Peirce lies mainly in the beginning of his carreer; he refers to Peirce's early semiotic work at several occasions around the *Philosophie der Arithmetik* period, but there is no reference later than the nineties, so Husserl never came to know the mature Peirce's phenomenology and semiotics from around the turn of the century, and so he hardly influenced Husserl's later thinking. Conversely, Peirce several times refers to *Logical Investigations* which came out in the midst of Peirce's last fertile period of thought - but he only mentions it in a pejorative manner, classing it alongside other German logic studies as despicable examples of psychologism. This characterization evidently rules out that he may in fact have read very much of the book himself.

Husserl's Peirce references mainly surface in his review of the first volume of Schröder's *Algebra der Logik* (1890; a work much influenced by Peirce, to be sure) from 1891 (Hua XXI, 2-43) and his subsequent discussions with A. Voigt (1893, also in Hua XXI). Here, Husserl's main idea is to reject Schröder's view of logic as being extensional only, even if he also praises him for his work. He was subsequently reproached by A. Voigt (reprinted in Hua XXI) for overlooking the intensional logics of Frege and Peirce and replied to that comment. Even if Husserl mainly refers to Peirce as a precursor of Schröder, a couple of interesting comments are involved: Husserl frowns over Peirce's idea of assertions as presented by Schröder, it is "unglaublich aber wahr" that he may think judgments are special cases of thought habits (20). Husserl probably here fails to grasp Peirce's wide and non-psychological idea of habits. On the other hand, Husserl praises Peirce's method from "On the Algebra of Logic" (in Schröder's presentation) as one which "... impresses through its special originality, simplicity and elegance. It appears, especially after the simplification which *Schröder* gives it, as eminently useful, and for that reason it should be wished to receive a richer amount of related and calculated tasks."[iii] Mullin (1966) remarks that these recensions were in Peirce's library with editor's stamp – so if Peirce did not himself receive them from Husserl, he got them from Schröder or (less probable, though) bought them in an antique book store.

The early Husserl thus may, to some extent, be influenced by Peirce through Schröder. The degree of Peirce's indebtedness to Husserl is equally difficult to ascertain. The mature Peirce decides upon the term "phenomenology" for a part of his study which in some respects are rather close to the early Husserl's use of the word as referring to the study of essences. It is the study of universal elements of all phenomena; it is a study explicitly anti-psychological (and ante-psychological) of nature; it is the most basic of all positive studies (by "positive", Peirce does not refer to empirical "Tatsachenwissenschaften" only, rather, "positive" refers to sciences of the given as opposed to sciences of the merely possible), and logic is founded upon it; it is a study that includes all kinds of possible experiences, including dreams and abstract thought; and it is a study – almost an outline of a Peircean phenomenological reduction - puts into brackets whether the phenomena it studies exists or not. Of course, Peirce does not share the later Husserl's basing phenomenology on a study of conscious acts, but this difference seems more a difference of emphasis within a field than it is a foundational difference.

"Phenomenology" did not play any important role in the papers published in Peirce's lifetime, but it rose to prominence due to Hartshorne and Burks' edition of CP where they picked it as a headline term – Hartshorne having studied by Husserl in Freiburg in the 1920s. That was no bad choice; Peirce's use of the term "phenomenology" is indeed intense, but covers a rather short timespan:

> Phenomenology, whose business it is simply to draw up an inventory of appearances without going into any investigation of their truth. ("Minute Logic", 1902, 2.120)

> Phenomenology ascertains and studies the kinds of elements universally present in the phenomenon; meaning by the phenomenon, whatever is present at any time to the mind in any way. ("Syllabus", 1903, EPII, 259; 1.185)

> I will so far follow Hegel as to call this science Phenomenology although I will not restrict it to the observation and analysis of experience but extend it to describing all the features that are common to whatever is experienced or might conceivably be experienced or become an object of study in any way direct or indirect. ("Harvard Lectures on Pragmatism", 1903, EPII, 143; 5.37)[iv]

> This science of Phenomenology is in my view the most primal of all the positive sciences. That is, it is not based, as to its principles, upon any other positive science. By a positive science I mean an inquiry which seeks for positive knowledge; that is, for such knowledge as may conveniently be expressed in a categorical proposition. (ibid., EPII, 144; 5.39)
>
> . . . Be it understood, then, that what we have to do, as students of phenomenology, is simply to open our mental eyes and look well at the phenomenon and say what are the characteristics that are never wanting in it, whether that phenomenon be something that outward experience forces upon our attention, or whether it be the wildest of dreams, or whether it be the most abstract and general of the conclusions of science. (ibid., EPII, 147; 5.41)
>
> The business of phenomenology is to draw up a catalogue of categories and prove its sufficiency and freedom from redundancies, to make out the characteristics of each category, and to show the relations of each to the others. (ibid., EPII, 148; 5.43)

> 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. (letter to John Dewey, June 1904, 8.242)

> (...) what I have called phenomenology, that is, just the analysis of what kind of constituents there are in our thoughts and lives, (whether these be valid or invalid being quite aside from the question). It is a branch of philosophy I am most deeply interested in and which I have worked upon almost as much as I have upon logic. It has nothing to do with psychology. (letter to William James, Oct. 1904, 8.295)
>
> Phenomenology has no right to appeal to logic, except to deductive logic. On the contrary, logic must be founded on phenomenology. (ibid. 8.297)

The word is also used in the passing in a letter to Lady Welby, Oct. 1904 (8.328), as well as in a 1906 commentary to a proposal by a Mr. Peterson to discuss philosophical terminology (*The Monist*, vol. 16, pp. 147-151 (1906), 5.610).

As is evident, the main period for Peirce's use of the term covers the years 1902-06 with the main emphasis on three years only, 1902-04. From around

1905, Peirce substitutes the terms “phanerology”, “phanerochemy”, “phenoscopy”, and especially “phaneroscopy” for “phenomenology”.[v] “Phaneroscopy” is used in the “Adirondack Lectures” (1905, 1.284), “Logic viewed as Semeiotics, Introduction Number 2. Phaneroscopy”, (1.285-87, dated by the editors of the CP “c. 1904”); “Phaneroscopy or the Natural History of Concepts”, (c. 1905, 1.322); “Phaneroscopy fan” (1906, 4.7), “Phaneroscopy (phan)”, (intended for the *Monist*, January 1907, 1.306), a letter to James (1909, EPII, 492ff; 8.303). Thus it seems that the substitution of “phaneroscopy” for “phenomenology” takes place rather systematically around 1904-05 - but due to Peirce’s intensive use of the latter in the fertile 1902-04 period and Hartshorne and Weiss’s subsequent use of it as a volume title in the *Collected Papers*, it has come to stand out as the standard notion for Peirce’s investigations in the area.

As a matter of fact, Peirce’s use of the word is not unrelated to Husserl’s, as is evident from the characterization above claiming that phenomenology “... studies the kinds of elements universally present in the phenomenon; meaning by the phenomenon, whatever is present at any time to the mind in any way.” - given that “the mind” in Peirce is not coextensive with the human mind, neither is it an empirical issue to be studied psychologically.

Thus, there is a striking temporal coincidence between Peirce’s use of the term “phenomenology” (1902-06) and his Husserl references. When Peirce discusses the origin of the concept, he refers to Hegel only, but this simultaneity points to the possibility of Peirce having borrowed the term from his – probably – cursory readings in LU.

As to Peirce’s explicit references to Husserl, they are rather few - twice he is mentioned only as part of lists of German logicians (“Minute Logic”, 1902; “Review of John Dewey’s Studies in Logical Theory”, *The Nation* 79, 15. Sept 1904, 219-20 (8.188)). Once, however, Peirce writes about “... the distinguished Husserl (Note: See, e.g., his *Logische Untersuchung*, Teil I, Kap. 3 (1900)) after underscored protestations that their discourse shall be of logic exclusively and not by any means of psychology (almost all logicians protest that on file), forthwith become intent upon those elements of the process of thinking which seem to be special to a mind like that of the human race, as we find it, to too great neglect of those elements which must belong, as much to any one as to any other mode of embodying the same thought.” - instead Peirce’s existential graphs are mentioned as an alternative, non-psychological rendering of logic. (1906, 4.7). Peirce shares a widespread criticism of Husserl at the time - for falling prey, in the later

Investigations, to the same psychologism which he himself attacks in the Prolegomena.

The missed encounter between the two thus seems to have a background in both of them misunderstanding the other's account of logic. Peirce emphatically saw logic as an ideal, normative science - Husserl likewise saw it as an ideal science, but equally emphatically not as a normative science. When Husserl rejected normative logic, however, it was simplistic accounts of logic as psychological "Denkökonomie" he had in mind. Thus, it seems that this less decisive difference made both of them misconstrue the other's point of view as being psychological. Peirce directly attacks Husserl for psychologism, and Husserl's attack on Peirce's – unbelievable but true! - identification of judgments with habits seem to rely on a presupposition that habits are psychologically contingent facts. This minor difference between the two seemingly spread fog over their basic agreement in antipsychologism to a degree so that none of them noticed it.

In any case, the closest similarity between the two's carreers seems to hold between the mature Peirce and the early Husserl, that is, coincidentally, between their thought as it develops simultaneously around the turn of the century, that is the period when Husserl writes *Logical Investigations* while Peirce strives to mould the mature version of his philosophy including phenomenology and semiotics. Just to enumerate a series of virtual meeting points between the two (each of which could merit a separate study)
- their basis in an anti-psychological 1st-person perspective (even if very different outcomes eventually spring from this idea in the two of them)
- the giving up of the inner/outer dichotomy in favour of a functional relationship between subject and object (cf. Rudolf Bernet).
- the refusal of all Ding-an-sich-like notions by emphazising the reality of the object as it is known (and, correlatively; the perfect knowledge of an object as a limit case to a series of knowing acts)
- the interest in making a taxonomy of different ways of approaching an object (in Husserl: the inventory of different intentional acts and their components: in Peirce: the taxonomies of signs and their components). There is even a certain structural similarity (albeit not identity) between Peirce's well-known icon-index-symbol triad and Husserl's imaginative-indexical-signitive intentions in the 1st and 6th LU.
- the foundation of logic upon phenomenology.
- the emphasis on autonomous forms in logic (Husserl: *nominale und propositionale Akte - Schlüsse*; Peirce: rhema-dicisign-argument) – and their ensuing a priori theories of linguistics and semiotics, respectively.

- the conception of complicated cognitive acts/signs as founded on a motivated complex of simpler acts/signs.
- the conception of meaning as being general (as a species of meaning acts (early Husserl anno LU) or a type (Peirce, at least in so far as regards sufficiently complicated and interesting signs))
- the anti-Cartesian refusal of absolute doubt in favour of doubt within a horizon
- the striving for a phenomenological solution to the problem of how mathematics and universal, objective knowledge in general may be shared by subjective acts of knowing.
- the discovery of (proto-)speech acts (Husserl: the notion of different act qualities and the frame question of the 6th Investigation; Peirce: the so-called "Gamma graphs").
- the introduction of variables as empty "slots" in logic and semantic expressions
- an Aristotelian realist tendency to claim the reality of species and our direct access to them (eidetic phenomenology and "Wesenserschauung", Husserl; the generality of perceptual judgments and the "pragmatic maxim" and diagram experiment as means of clarifying a concept in Peirce), along with the idea that the law of the excluded middle does not hold for ideal matters
- the positive redefinition of the synthetic a priori (as "pure laws including material concepts" (Husserl, 3rd Investigation) or as "universal propositions relating to experience" (Peirce))
- a criticism of empiricist and psychological theories of abstraction in favour of an "ideierende Abstraktion" (Husserl) or Peirce's complex of abstraction types - and even the close connection between the conditions of possibility of abstraction and a mereology for the phenomenon (Husserl's 3rd Investigation; Peirce's definition of his three types of distinction).
- the attempt at giving a rational exposition of the loose Kantian idea of a schematic meeting between "Sinnlichkeit" and "Verstand" in epistemology (Husserl: "kategoriale Anschauung", Peirce: diagrams).

The aim of this chapter is to compare Husserl's account of categorial intuition in the 6th LU (and its prerequisites elsewhere in that work) with Peirce's diagram and diagrammatical reasoning notions. Just like Peirce develops his notion of diagram-icons to understand the observation aspect of the access to ideal and universal objects, Husserl undertakes a daring extrapolation of the concept of intuition ("Anschauung") to involve the grasping of grammar and linguistic syntax, of essences, of states-of-affairs, etc. Thus, analogous roles are played by diagrams and categorial intuition[vi]

in Peirce and Husserl around 1900, and the immediate difficulties in admitting this probably stem from their different *prototypes* of these notions: that of grammar and linguistic *syncategorematica* in Husserl, that of geometrical construction proofs in Peirce. Our aim here is to introduce the cross-fertilization between those two concepts to be put to use in an actual understanding of the cognitive ability to grasp, understand, and manipulate ideal objects.

Meaning and intuition in the Logische Untersuchungen

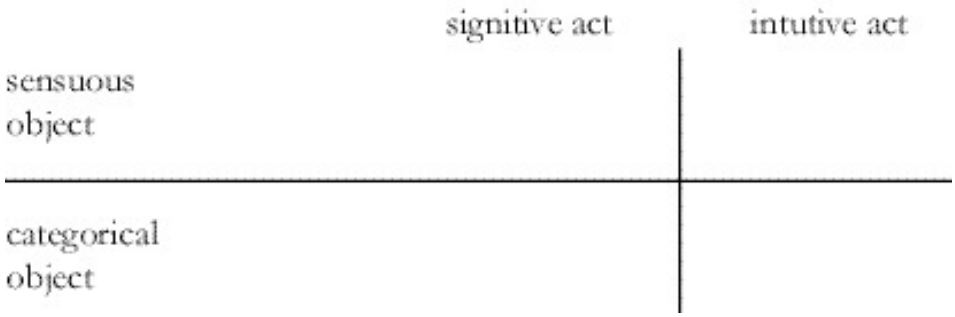
In Kant, of course, we find the idea that a crucial problem of epistemology is the possible mediation between what he considers two faculties of mind, *Verstand* and *Anschauung*, respectively. A simple integration between the two in a "intellectual intuition" is deemed impossible and the belief in its possibility leads into the "transcendental illusion". The possible mediation between these two is only deemed possible in the construction of rule-bound schemata (the arch examples being arithmetics, geometry (the triangle) in the realm of pure schemata, and the concept of the dog in the realm of empirical schemata). Each in their way, Husserl and Peirce strive to clarify the more precise relationships behind the sketchy Kantian deliberations.

In the LU, this problem is highlighted in the second section of the 6. LU but with close ties to various other chapters throughout the book. The prerequisite to understanding the ideas given in the 6. LU is, of course, the structure of the intentional act as outlined in the 5. LU. Here, Husserl distinguishes between the act itself, its content and its object. The content is the act's meaning conceived of as species, and it, in turn, includes three dimensions: the quality of the act (its character of being propositional, imperative, wishing or whatever), the matter of the act (the way the object is presented), and the representative content of the act (the degree of fulfilment in which the object is presented: intuitive vs. signitive acts). In the intuitive acts - of which perception is the prototype -, the object is immediately given in "anschauliche Fülle", but in other, more distant acts, the object is merely intended in a symbolic fashion, the so-called signitive acts, which prototypically comprise linguistic expressions (but not only, cf. below). The meaning of signitive acts has no intuitive character, but, on the other hand, they aim at being fulfilled by synthesis with decidedly intuitive acts (not unlike symbols requiring icons for making explicit meaning in Peirce). This more complicated, founded act forms the "Erfüllungssynthese", that is, it fulfils an immanent striving present in the merely signitive acts. This very tension between signitive and intuitive acts forms Husserl's version of

Verstand and *Sinnlichkeit*, respectively, and it is at stake in any linguistic and symbolical act in general as well in science more specifically. This fulfilling of an empty signitive act is thus a higher-order act, involving the *Leervorstellung* of the signitive act, its intuitive fulfilment, as well as the act founded upon the two which unites them.

A host of problems are involved here. For in sufficiently complicated acts, the signitive act contains lots of elements not immediately present in the fulfilling perception. Husserl's introductory example in the LU is sentential structure; all the *unselbständige* moments of the sentence apart from the material presented in the nominals subject and predicate: quantifiers, conjunctions, numerals etc. - the syncategorematica of the 4. LU. This leads to the idea of the *kategoriale Anschauung*, "categorial intuition". The basic claim of phenomenology: that the justification of any kind of knowledge ultimately derives from the possibility of grasping it in intuition, is extended to include these "categorial" aspects of meaning. Thus the concept of intuition is generalized to encompass categories. The categorial content of the act also aims at its own fulfilling intuition, that is, the idea that the object of the logical and formal apparatus of the expression can in some sense be grasped intuitively as it is in itself, in perfect analogy with the perceptive fulfilment of the parts of the expression referring to sensible objects. Categorial intuition thus comes to bear an immense weight in Husserl's epistemology: it becomes responsible for the grasping of all that is not simply perceptual[vii]. To be blunt, categorial intuition is what makes Husserl differ from a crude sensualism. Thus, it involves not only syncategorematica, but all kinds of ideal objects taken in a broad sense of the word: states-of-affairs, logic, mathematics, formal ontological categories, material ontological categories, all sorts of natural and cultural kinds, word meanings[viii]. Thus the different essences grasped by eidetic variation already introduced in the LU are intended by categorial intuition which thus subsumes *Wesensschau*.[ix] And thus the ideal objects grasped by categorial intuition include Ingarden's "purely intentional objects" involving the objects of linguistic meanings in general and literary works in particular. In introducing the new distinction between signitive and categorial, Husserl clarifies aspects which were mixed up in the Kantian outline: on the one hand, we have merely signitive meaning aiming at its intuitive fulfilment. On the other hand, we have two different forms of intuition, sensuous and categorial, respectively - and the categorial intentions possess their own type of intuitive fulfilment, more or less remotely founded upon sensuous intuition, to be sure.

This gives a combinatiorial table as follows:



There are two possible sides to the signitive act; one side which requires fulfilment in a categorial intuition, another side requiring fulfilment in a sensuous intuition – maybe both in one synthesizing act. Apart from very simple cases, most acts include categorial components (as soon as perceptual judgments are passed, for instance, or general properties of any kind are invoked, categorial meaning is implied). A pure intuition is only possible, it should be added, in the cases of certain types of objects (i.e. mental acts and certain species and universals[x]), but emphatically not in the cases of empirical objects, in which only partial fulfilments are possible due to their appearance in adumbrations.

The first axis (signitive-intuitive) is complicated by the fact that other types of approaches to the object are possible: intuitive acts comprise also imagination which presents its object through (partial) similarity, only without allowing immediate fulfilment. (Here, imagination should probably be taken to include imagery, fantasy, and memory alike, which were subsequently distinguished in Husserl's writings in the years after the LU (see ch. 14)). Finally, the combinatorial table given above is complicated by the fact that signitive intentions typically involve categorial meaning[xi]; only signitive intentions with no syntax nor generality (exclamation of simple word meanings) might constitute a limit case.

The problem of meaning

This ingenious construction leaves one question open: how is the fulfilment of a signitive act (a categorial form, respectively) performed? As Jocelyn Benoist (Benoist 1998, 136) has remarked, "The paradox is that a signitive categorial form can only be satisfied by an intuition which is already itself categorized."[xii]

The problem is that no positive determination of the meaning part of the signitive intention, taken separately, is undertaken. On the one hand, signitive acts are distinct from mere indexical *Anzeichen* [xiii]; on the other hand, meaning is distinguished from all kinds of psychological imagery, representations, "Vorstellungen". Meaning, in the original 'species theory of meaning' of the LU, is seen as the species whose instantiations are the single mutually synonymous meaning acts, but this does not indicate how the meaning in the specific case can be characterized.

But without any further positive determination of the meaning concept, it remains difficult to describe precisely why a specific meaning finds its fulfilment in the exact set of intuitions it does. We know from the criticism of the empirical abstraction theories in the 2nd LU that the way we make an "ideierende Abstraktion" is analogous to what Husserl later in *Experience and Judgment* calls eidetic variation; that is, we substitute for all non-essential parts of the phenomenon empty, algebraic variables, making it possible to focus upon the invariant species left. This variation procedure must not be understood, of course, as if the specific core left was itself untouched by the variation which investigates which range of variability the species left is able to assume.[xiv]

Categorial meanings and objects

The meaning, respectively object side of the act are easily distinguished in the prototypical categorial case of logic. Logic categories include *subject, predicate, proposition,* etc., and the corresponding object categories include *object, property, state-of-affairs*, etc. In general, logical categories refer to object categories pertaining to what Husserl calls *formal ontology,*[xv] the general science of objects without regard to their material qualities. This apparently simple duality between formal logic and formal ontology hides some complications. Both are species concepts, but meaning species and object species are not identical, even if the grasping of the second by means of the first plays a crucial epistemological role. Both, consequently, are species made explicit by the ideational abstraction described in the 2nd LU. At the same time, categorial meanings form a crucial part (that is, moment) of sufficiently complex, "sinnlich gemisschte" empirical meaning species in general (cf. below), just as categorial objects form parts (that is, moments) of empirical object species. This forms the central link in Husserl's solution to the problem of epistemology: by means of the dependency calculus in terms of parts and wholes, complex objects characterized by specific sets of

interrelated parts may be represented in signitive meanings characterized by analogous interrelation systems between their parts[xvi]. This implies the possibility for manipulating with empty, signitive meanings without constant reference to their intuitive fulfilments: the (partial) isomorphism of the manipulation rules guarantee the fulfilment possibility. This basic idea is analogous to Peirce's general diagram concept in which the crucial feature is that the diagram is a sign representing its object by a schematic figure connecting parts by means of rational relations, that is, precisely a mereological analysis of the object in terms of ideal relations graspable by abstraction. This analogy leads to the question of this chapter: what precisely, does categorial meaning comprehend? It goes without saying that the basic logic categories form prototypical categoriality, but as categoriality is present wherever we rise from a purely sensous perception fulfilment, logic is not sufficient for describing categoriality[xvii].

A whole series of problems is connected with this issue: the role played by categoriality in fulfilment of signitive intentions; the status of pictorial signs (and the categoriality inherent in them) in relation to the grasping of ideal objects; the principle of variation in the determination of species in general.

Meaning as the determination of a range of possible intuitions

Let us take a closer look at what meaning is supposed to *do*. In the beginning of the 6. LU it is laconically stated that "The 'generality of the word' means, therefore, that the unified sense of one and the same word covers (or, in the case of a nonsense word, purports to cover) an *ideally delimited manifold of possible intuitions*, each of which could serve as the basis for an act of recognitive naming endowed with the same sense." (6. LU, vol. 2, p. 691-92/ Hua XIX 563, our italics) This is exemplified as so often before in the word "red": "To the word 'red', e.g., corresponds the possibility of both knowing as, and calling 'red', all red objects that might be given in possible intuitions. This possibility leads on, with an *a priori* guarantee, to the further possibility of becoming aware, through an *identifying synthesis* of all such naming recognitions, of a sameness of meaning of one with the other: this *A* is red, and that *A* is *the same*, i.e. *also* red: the two intuited singulars belong under the same 'concept'." (ibid.). The bound variation of the species meaning in question may singularize it in particular instantiations. Thus, it is the opposite operation of the variation undertaken in the abstraction process' isolation of the species in the first place.

This eidetic variation procedure can allegedly be applied from the most simple to the most complicated cases; in the *Prolegomena*'s conclusive and ambitious outline of a "theory of theories" concentrating on theoretical form, we find the same idea at the level of whole theories: to substitute for its given parts undetermined variables to leave only the formal categorial structure of the theory behind (§ 67).[xviii] Furthermore, the variation can be extended to involve the formal structure itself: by the variation of basic factors in the theory, the conditions for the transposition of one theory into another may be made clear (§ 69). Correlatively, on the object side of the theory, the domain of knowledge corresponding to the purely formal theory will be the idea of pure mathematics in general, the *Mannigfaltigkeitslehre* (§ 70). If space, writes Husserl, is the categorial form of cosmos, studied by geometry, then this is only a part of a genus of categorially determined manifolds describing space in a generalized meaning of the word. Here, the categorial form of the theory is strictly correlated to its object side. To the formal logic of the former corresponds the formal ontology of the latter.

In the 2. LU, Husserl returns to the question in the famous discussion of the general triangle in the British empiricists. He refutes Locke's claim that the non-existence of the general triangle should imply that it is only a mere invention of understanding, and he critizises Hume's psychologistic and nominalist idea that a singular representation becomes general merely by means of the addition to it of a general name. On the other hand, Husserl is close to Berkeley at this point: the universal is a singular idea used to represent all other singular ideas of the same sort, provided that representation here is read as implying meaning rather than reference, as triggering rather than substituting. The single sign may not refer to an infinity in extension, but it means "any triangle, no matter which one"[xix]. Thus, the role of singular illustrations for universal concepts, tokens for types, should be, Husserl repeats over and over, taken as trigger ("Anhalt") rather than substitute ("Stellvertreten"). So it is a *means* of grasping the thought rather than a *substitute* for it, but it is not necessarily a less prestigious role to be *Anhalt* than *Stellvertreter*. For the role of the trigger seems to be an illustration - an ilustration subsequently to be read in an eidetic fashion, and, in turn, to be varied eidetically in order to yield "any triangle".[xx]

Variation and abstraction

In the conclusion to the 2. LU's eidetic abstraction theory, Husserl explains the extended meaning of abstraction as follows: "Thus we directly apprehend the Specific Unity *Redness* on the basis of a singular intuition of something red. We look to its moment of red, but we perform a peculiar act, whose intention is directed at the 'Idea', the 'universal'. Abstraction in the sense of this act is wholly different from the mere attention to, or emphasis on, the moment of red; to indicate this difference we have repeatedly spoken of *ideational or generalizing abstraction*." (2. LU, vol. 1, p. 432/ Hua XIX, 226).

In this two-tier account for abstraction (emphasis - generalization) there is a surprising similarity to Peirce's abstraction theory, in which he puts great weight on distinguishing various types of abstraction having to do with the distribution of attention to selected aspects of the object on the one hand (involving three types of "distinctions"), and the so-called "hypostatic abstraction" on the other. The seminal attention focussing abstraction, which enables us to distinguish parts which can not act as distinct unities, is "prescission"[xxi]. But this focussing mecanism, however important, does not in itself lead to higher degrees of abstraction. The property focussed upon must, in turn, be made subject to "hypostatic abstraction" which makes of it a general noun as a subject for a new proposition with predicates to be determined. This two-step abstraction mecanism seems to make explicit what Husserl is more briefly outlining in the 2. LU in the quote given with its distinction of the "Hervorheben" and the "generalisierender Abstraktion", the emphasizing and the ensuing generalizing abstraction.

To return to the issue of the 'illustrative' aspect of meaning, this abstraction account seems to clarify what we more exactly do when using a picture as "Anhalt": first, we emphasize the moment of it in question ("Red", "Triangle"), second, we generalize this moment of it by variation which is what, third, permits us to give it a specific, nominalized name ("Redness", "Triangularity"). But once this has been achieved, there is, conversely, a way "back"; by using variation we may now devise the "ideally delimited manifold of possible intuitions", that is, we may, by variation, produce any particular triangle. The variation principle delimits the manifold. The question here is: what is the part played by categoriality in this relation of variation between signitive intention and intuitive fulfilment?

Husserl's examples in the Logische Untersuchungen

Husserl's general description of categorial intuition suffers from the same defects as does the analogous description of sensuous fulfilment - we do not know the precise road from signitive categorial intentions to fulfilled categorial intentions presenting categorial intuitions. But unlike the case in the perceptual counterpart, we do not even have a clear idea of what the relevant fulfilment looks like. Husserl's own primary examples point to formal logic and its use in linguistic syntax of empirical languages as for instance when he considers the example of conjunction ("and"). He writes, in a famous passage, that the act of conjunction is different from simple - non-categorial - perceptions of sensously given unitary sets, series, swarms etc., because it is a distinct act adding the contents of two former acts to mean the compound content "A and B". So this conjunction is a founded, categorial act requiring its own intuitive fulfilment.[xxii]

Some of the more complicated examples given in the course of the LU may throw some light upon this issue - e.g. the mathematical expression to be calculated; the map of England; the recognition of Goethe's handwriting; the model of the steam engine. Husserl himself does not make any categorial conclusion to this variety of examples, but taken together, they make it possible to outline what we may conceive categorial intuition to involve. Not all of these examples are given in the relation to the 6th LU's chapters on categorial intuition, but still they involve different aspects of it.

The first example concerns the mathematical expression and is concerned with mediate fulfilment. It is not the case that the meaning of a complicated expression is of the same kind as a simple word meaning. On the contrary, the complicated expression facilitates "... the possibility of *fulfilment-chains built member upon member out of signitive intentions*. We clarify the concept by having recourse to the definitory presentation: Number which arises when one forms the product · · · ." (6. LU, vol. 2, p. 723/Hua XIX, 601) In the same manner, this expression takes us back to simpler definitions, and every step in this operation is an act of fulfilment, prescribed by the signitive representation: "A remarkable property of the cases just discussd, and of the class of significative presentations which they illustrate, lies in the fact that in them the *content* of the presentations - or, more clearly their 'matter' - *dictates a determinate order of fulfilment a priori*." (6. LU, vol. 2, p. 724/ Hua XIX, 602) What can be learnt from this example is that certain expressions allow their contents to be constructed by an ordered, stepwise operation with increasing fulfilment. If we generalize this to other mathematical expressions we can add that it is far from always the case that the procedure to be undertaken is unanimous

nor clear. An equation may be solved in different ways, in different variables; maybe it may not be solved at all; maybe it is not even known whether it may be solved (Goldbach's conjecture). In short, in expressions like these, a (in some respects) rule-bound but otherwise (in other respects) free operation can be performed in order to seek fulfilment, but only in some cases is it clear that stepwise fulfilment is able to reach its goal.

This may be compared to an example given a couple of pages earlier on an intuitive series of fulfilment: "Another example of an intuitive fulfilment-series is the transition from a rough drawing to a more exact pencil-sketch, then from the latter to the completed picture, and from this to the living finish of the painting, all of which present the same, visibly the same, object." (6. LU, vol. 2, p. 721/Hua XIX, 599). This fulfilment series has a slightly different character from the mathematical case - also apart from involving imaginary rather than signitive intentions. In the painting series, the earlier stages may be left behind, once the latter more fulfilled ones are reached - not so in the mathematical example where it is important to remember the expression of which the number 244140625 is in fact the result. Here, conversely, might as well serve as a fulfilment of this number, in an intention pointing the opposite way, given the signitive intention (much more difficult, to be sure) to resolve it into its prime factors.

A peculiar case concerns what Husserl calls "signitive intentions outside the meaning function" - referring to acts of classification without the relevant word being invoked. The recognition of an object as a Roman roadstone or of a tool as a drilling machine, for example - but separated from the uttering of the corresponding word. The classification of a phenomenon as belonging to a species, a token to a type, thus seems to be the pure function of the signitive intention[xxiii]. "Objects are, strictly speaking, only 'known', as they are given in their actual intuitive foundation, but, since the unity of our intention ranges further, objects appear to be known as what they are for this total intention. *The character of knowing is accordingly somewhat broadened*. Thus we recognize (know) a person as an adjutant of the Kaiser, a handwriting as Goethe's, a mathematical expression as the Cardanian formula, and so on. Here our recognition can of course not apply itself to what is given in perception, at best it permits possible application to intuitive sequences, which need not themselves be actualized at all." (6. LU, vol. 2, p. 716/ Hua XIX, 593). With the signifier of the expression placed in brackets, this paragraph in fact presents the signitive intention *in nuce*: it concerns the pure species and the problem of how, given a concrete perception, this perception is classified as instantiating the species: a piece

of handwriting identified as Goethe's. This, in fact, is to our day still a problem hard to solve: how is it possible to identify a style of writing? From a general point of view, this question may be of the same kind as those about the emperor's servant and Cardan's theorem, but from a more detailed cognitive science point of view, there is a huge difference. The simple version of variation is certainly not possible in the Goethe's handwriting example: there are no simple parts which may be replaced with algebraic variables. Rather, the species are grasped through the variation of the whole with certain stylistic features kept constant: the variation of the type of ink and the type of paper is easily performed, but more difficult is the variation of the written expression with the style kept invariant. We can not seriously assume a variation which *de facto* covers all possible texts in the world, rewritten using Goethe's handwriting, rather we implicitly grasp the idea of such a variation and judge it possible in principle. Goethe's style is grasped as a set of certain, typical, stable variative aberrations as compared to a normal zero handwriting.[xxiv] This is an adaptation to intuition processes which need not be actualized themselves: we need not see for our inner gaze other examples of Goethe's handwriting in order to recognize an example of it, this variation is presumably undertaken without being explicit in consciousness.

From this example, two things can be inferred: that the main problem resides not in the (mostly arbitrary) relation between word expression and meaning, but in the relation between meaning and its fulfilment; that the variation process involved in classification may vary the content continually while keeping general moments invariant which characterize the whole of the object and which are hard, maybe impossible, to make explicit as such.

A further example is the map of England, a prototypical diagram example. Husserl mentions it as an example of an indirect representative serving as partly fulfilling intuition: "... as when the use of a geographical name calls up the imaginative presentation of a map, which blends with the meaning-intention of this name ..." (6. LU , vol. 2 p. 727/ Hua XIX, 606). When the fulfilling of the name "England" is performed by a map (instead of the object itself), it sure is an indirect object. "The analogy of what appears and what is meant, which may be present here, does not lead to a straightforward presentation by way of an image, but to a sign-presentation resting upon the latter. The outline of England as drawn on a map, may indeed represent the shape of the land itself, but the pictorial image of the map which comes up when England is mentioned, does not *mean* England itself in pictorial fashion, not even mediately, as the country pictured on the

map. It means England after the manner of a mere sign, through external relations of association, which have tied all our knowledge of land and people to the map-picture." (ibid.) The map referring to England is seen as a complicated expression with several levels; the iconic qualities of the map in relation to England is superposed by the use of it as a sign referring to England as the object, including the associative connections to our diverse knowledge of that country. So the map is no mere picture even if built on iconic qualities. It must be considered as a diagram which implies two things: a similarity between map and object plus, in turn, the use of the map as a sign for the object, including association with qualities not directly mapped therein.

What can be learnt from this example is that the map has a double foundation, composed of a moment of similarity on the one hand and a signitive intention on the other.

The last of Husserl's scattered examples concerns the most typical diagram example in the LU: the steam engine model. The example occurs in the context of the chapter of the sixth LU conclusive to the exposition of sensuous and categorial intuitions. The chapter introduces the crucial distinction between the categorial synthesis of simple perceptions on the one hand (e.g. particular states-of-affairs) - and general intuitions with general objects on the other, giving rise to *synthetical* and *abstractive* categorial intuitions, respectively. In the former, the founding acts' objects are included in the founded acts, not so in the latter - but both are categorial acts. Accordingly, we may distinguish at least three types of involvement of categorial intuition: one is present in the categorial moments of simple perception judgments, e.g. of concrete states-of-affairs. Another is the pure grasping of categorial structures in specie, in logic and mathematics. And yet another is the use of categorial means to grasp general empirical objects.

A crucial observation here is the following: "Talk of 'perception' presupposes the possibility of correspondent imagination: a distinction between them, we held, is part of the natural sense of our ordinary talk about 'intuition'. But it is just this distinction that we cannot here draw. This seems to stem from the fact that abstractive acts do not differ in consonance with the character of the straightforward intuitions which underlie them; they are quite unaffected by the assertive or non-assertive character of such underlying acts, or by their perceptual or imaginative character." (6. LU § 52, vol. 2 p. 800/ Hua XIX, 691) The fact that the distinction between imagination and perception becomes irrelevant in the case of categorial intuition is very important: it implies that when talking about categories, an imaginative fulfilment is as good as any. This brief statement is ripe with

consequences. The function of imagination as access to ideal structures is implied, just as the role of thought experiments in science and thought in general. This implies, moreover, that merely imaginative representatives of categorial structures may be used as completely fulfilling signs for them. As to the categorial structure of an object, an image of a special, general kind (or, as Peirce calls it, a diagram) permits us to directly grasp the very category in specie. This includes a general categorial "reading" of a particular example, cf. the discussion of Locke's triangle above. An individual object can not serve as an analogy of itself, Husserl writes, but "It is quite different in, e.g., the case where mathematical analysis has given us an indirectly conceived Idea of a certain class of curves of the third order, though we have never *seen* any curve of this sort. In such a case an intuitive figure, e.g. of a familiar third-order curve, perhaps actually drawn, perhaps merely pictured, may very well serve as an intuitive image, an analogon, of the universal we are intending: our *consciousness of the universal is here intuitive, but analogically intuitive, in its use of an individual intuition*." (6. LU § 52, vol. 2, p. 801/ Hua XIX, 692, our italics). This interesting claim is what is examplified in the steam engine example: "And does not an ordinary rough drawing function analogically in comparison with an ideal figure, thereby helping to condition the *imaginative character of the universal presentation?* This is how we contemplate the Idea of a steam-engine, basing ourselves on a model of a steam-engine, in which case there can naturally be no talk of an adequate abstraction or conception. In such cases we are not concerned with significations, but with universal representations by way of analogy, with universal imaginations, in short." (ibid.; the German version has: "In solchen Fällen haben wir es mit keinen blossen Signifikationen zu tun", so the English quote should rather talk about "*mere* significations")

This characterization of the model of the steam engine[xxv] thus unites iconicity and generality, Peirce's two major characterizations of the diagram. Unlike the merely signitive word "steam engine", the model implies a general imagination of the idea of such a machine - and the act of imagination is in abstract, categorial cases a complete fulfilment. But implicitly, it also displays the third major feature of diagrams: the possibility for experimenting. A model of a steam engine only reveals the idea of the working of this apparatus when conceived of in a temporal, operational, and experimental fashion. The model gives rise to a thought experiment, letting water be heated, steam to be produced and suddenly cooled with the characteristic working process of the machine as a result. Mobile parts of the

object possible to manipulate physically may add to the efficency of such thought experiments. This feature of the diagram is only implicitly present as a necessary feature in Husserl's steam engine example, but in the mathematical example above it was made explicit in the idea of a stepwise, operational *Erfüllungsreihe*.

To sum up: categorial intuition and its use in the direct "erschauen" of meaning as species constitutes a strikingly close (even if much less explicit) parallel in the LU to the mature Peirce's diagrammatic epistemology. Peirce's distinctions between pure and applied diagrams find a counterpart here in the distinction between pure categorial intuition (in which categories are grasped in abstraction from the acts they spontaneously appear in) and categories put to use in the grasping of empirical species (as the steam engine) or of empirical state-of-affairs. Furthermore, Peirce's extrapolation of logic from formal inference schemata to cover a much wider range of signs finds its (implicit, that is) counterpart in the (few, but) widespread examples in Husserl's text making it clear that not only logic, but also geometry and the whole "Mannigfaltigkeitslehre" of the *Prolegomena* form the content of pure categorial intuitions, possibly to be put to use, in turn, in applied - "sinnlich vermisschte" - categorial intuitions.

Finally, it must be the more or less perfect grasping of categorially formed species that allows for the mysterious route leading from signitive intentions to intuitive fulfillings. How should the passage from the word "steam engine" to the perceptive fulfilling of it be possible if not via the intermediary (maybe only parts or aspects of) a general, imaginative model of it? [xxvi]

The ambiguous status of pictures in the Logische Untersuchungen

Taken as a whole the LU remain ambiguous as to the role of pictures. It seems as if two tendencies are *verschmeltzt* in the early Husserl: one is the phenomenological turn against psychologism; the other is the formal turn against imagination to the benefit of formal calculi, and I believe there is a tendency in Husserl to identify or confuse the two. This can be seen in his repeated arguments against "phantasies" in the question of semantics - all at the same time as the steam engine example admits the crucial role of imagination in categorial intuition fulfilment. But this identification is misplaced. There are two strands in this argument. One is the anti-psychological argument: semantics is not psychology and meaning must be

conceived of as an ideal, phenomenological species and should not be taken to rely on more or less contingent, individual fantasy pictures only. But this does not entail that semantics is formal understood as devoid of intuition, rather it necessitates a concept of phenomenologically pure, eidetic pictures, the "allgemeine Imaginationen" that Husserl points to at the end of the central chapter in the 6. LU - that is, diagrams.

The ambiguous attitude towards pictures is mirrored in a similarly ambiguous attitude towards space. Husserl writes for instance (3. LU, vol. 2, p. 455/ Hua XIX, 256) in connection with the redefinition of analytic/synthetic concepts that ideal objects comprise two types, the essences to which "... correspond the concepts or propositions which have content, which we sharply distinguish from purely formal concepts and propositions, which lack all 'matter' or 'content'. To the latter belong the categories of formal logic and the formal ontological categories mentioned in the last chapter of the *Prolegomena*, which are essentially related to these, as well as to all syntactical formations they engender. Concepts like Something, One, Object, Quality, Relation, Association, Plurality, Number, Order, Ordinal Number, Whole, Part, Magnitude etc., have a basically different character from concepts like House, Tree, Colour, Tone, Space, Sensation, Feeling, etc., which for their part express genuine content", the two categories of concepts giving rise to formal and material ontologies as analytical and synthetic disciplines a priori, respectively. Here, surprisingly, space is classified alongside the other material species belonging to different material ontologies. This classification of it apparently runs counter to what is said in the conclusion of the *Prolegomena* where we find the idea that the correlate to a purely formally conceived theory is a field of experience in general, this field in turn to be studied by Husserl's general conception of mathematics, the "Mannigfaltigkeitslehre". But here, this study *includes* space, placing it on the purely formal level, far from the "sachhaltige" rendering of it in the quote above: "... if we mean by 'space' the categorial form of world-space, and, correlatively, by 'geometry' the categorial theoretic form of geometry in the ordinary sense, then space falls under a genus, which we can bound by laws, of pure, categorially determinate manifolds, in regard to which it is natural to speak of 'space' in a yet more extended sense." (*Prolegomena*, § 70, 242/ Hua XVIII, 252). Thus, the specific concepts of space pertaining to each material ontology are but species of a formal genus of space belonging to formal ontology. But this general space category implies that space is also among the categories finding fulfilment in the categorial intuition. This allows for the Husserlian

counterpart to Peirce's pure diagrams (requiring space) with no reference to any actual existence.

This allows us to return to the issue of the possible role of pictures in the fulfilment of signitive intentions. As a geometer, Husserl agrees completely with the formalist tendencies of his time:
"It is a well-known fact that no geometrical concept whatsoever can be adequately illustrated. We imagine or draw a stroke, and speak or think of a straight line." (1. LU, vol. 1, p. 302/ Hua XIX, 70). The picture drawn is no representative of the geometrical object - cf. Locke's triangle - but is a mere "Anhalt", a trigger for a more precise fulfilment, just like Peirce's diagram token is not in itself a representation but merely a precondition for the diagram type to be grasped. Now, given the possibility of a stepwise fulfilment with an increasing degree of fulfilment, this role of "Anhalt" may be given a more detailed description: the picture is read in an eidetic manner, governed by the signitive intention present (for instance, the picture of a triangle accompanied by the word "triangle" - as opposed to the same picture accompanied by the word "manifold", "polygon", "Jordan-curve", etc., emphasizing other moments in it). This eidetic reading of the concrete picture is a higher-level categorial act, founded on the signitive and pictorial acts alike, and it makes possible the eidetic imagination of the general picture. The concrete drawing is not general, but the categoriality of the signitive intention present prompts such a reading. Husserl himself does not consider further this interplay between pictorial and signitive intentions leading to eidetic imagination, but Peirce's diagram concept does just that. It emphasizes the diagram's double determination: it is an icon in so far as it is a (skelettal) picture of its object, but it is governed by a symbol permitting the emphasizing of the relevant aspects of the picture intended. In so far, the interplay between symbol and icon, signitive and pictorial intentions, prompts eidetic abstraction permitting to imagine the pure species. This species may now, in turn, be used to map the relation structure of widely differing objects (triangle trade, erotic triangles, triangulation in navigation, etc.). The diagram category thus makes evident that the mereological dependency calculi of the 3rd LU kind are necessary but not sufficient for formal ontology. Mereology needs supplementation by other branches of mathematics; geometry, topology, and category theory are prominent candidates, but only ongoing investigation will show which formal disciplines will be needed adequately to map the categorial properties of diagrams and the corresponding categorial objects they depict.

Husserlian categorial intuitions and Peircean diagrams

To sum up, in the relation between signitive and intuitive acts, categorial intuition plays the role of:

- permitting the synthesis of contents into all kinds of nominal objects and states-of-affairs
- permitting that the eidetic variation be a crucial step in grasping species, that is, meaning. Once the species is constituted, the variation procedure may work in the other direction furnishing the species with possible particular instantiations
- permitting the rule-bound, stepwise fulfilment of certain signitive acts (the mathematical and the sketch examples)
- permitting the adequate grasping of structures in formal ontology, this implying the necessity (as Jean Petitot points out) of geometrising the basic structures in formal ontology.[xxvii]
- to grasp the content of complicated empirical species (the steam machine example) by permitting rule-bound operations involving its parts in specific configurations.

All these points make categorial intuitions play roles analogous to those played by the diagram in the mature Peirce's theory of knowledge. Here, diagrams are similar to their objects in two crucial aspects: they form relational, mereological analyses of their objects, and – as we saw in ch. 4 - they are subject to Peirce's operational criterion for iconicity: one phenomenon is an icon for another if and only if experiments or manipulations on the former may reveal new insight into the latter ("new" in the sense that the information in question is not explicity expressed in the icon). This implies that diagrams are the vehicles for all deductive reasoning - such reasoning simply being defined as manipulations on diagrams.

This procedural aspect of the diagram's iconicity is not explicitly thematized in Husserl's account for categorial intuitions, but it is, as shown, present in his examples. The crucial variation procedure itself is nothing but an operation on a diagram; the steam engine model permits to imagine the working of the machine in an operational procedure; the rule-bound transformation of the mathematical expression is another operation on a diagram.

In Peirce, this operational criterion for iconicity is tied to the continuity metaphysics: to perform an operation on the diagram implies the continuity between the single diagram instances which the operation connects - which facilitates the corresponding continuous unity of the

depicted object in space and time[xxviii]. From a Husserlian point of view, this central property in diagrams connects to several important issues. One is the idea clearly brought to the fore in *Ding und Raum*, that the very prerequisite for the unity of a logical entity is the continuum of *Abschattungen* of an object which makes their schematic synthesis possible. This forms the very basis of the founding of logic on phenomenology in Husserl, and it implies, as Jean Petitot remarks, that the categories of object and of logic both presuppose continuity. This casts a Husserlian light on the operational icon definition in Peirce's diagrams: it is because the object *itself* is defined by a range of continuous operations that a formalized icon may depict it by repeating (parts of) these operations. Furthermore, it connects time-consciousness intimately to diagrams - and to categorial intuition: it is only through the synthesis of temporal experience with the fulfilment series involved in diagram manipulation that the corresponding insight into its object becomes possible.

Diagrams as wholes with sensuous moment of unity?

Having thus argued for a "diagrammatizing" reading of categorial intuition and the LU, we may now let Husserl's conception throw a refining light back onto Peirce's ideas. For why is it that diagrams are so apt at capturing ideal objects? As Elmar Holenstein argues[xxix], Husserl's arguments in § 60 ff. of the 6. LU places him at a delicate intermediate position with respect to the different schools of Gestalt Theory. Husserl claims, of course, that categorial acts are founded upon sensuous acts - but, on the other hand, he does not claim the same for acts intending sensuos Gestalts which are grasped immediately. In the first claim, Husserl agrees with Meinong's and the Graz school's "theory of production"; in the second claim, though, Husserl is on a par with the Berlin School led by Koffka, claiming that the Graz view reintroduced sense data not pertinent in experience and invoking the direct perception of Gestalts instead. If Husserl is correct on this point, this may throw some light upon the efficacity of diagrams: they permit to grasp categorial contents *by the representation of them in sensuous Gestalts,* provided with signitive, categorial reading instructions. True, as we have seen, the sensuous Gestalt is by no means sufficient in itself (Locke's triangle) and it needs to be supplemented by general rules for its eidetic reading, for its variation, as well as for the experimenting upon it. The diagram (or, at least, the simplest significant part of it) must be graspable *in one glance* in order to represent the relevant species or type. There must be a

minimum of spontaneous Gestalt grasping for the mind to be able in any way to construct more complicated Gestalts on the one hand or to abstract features from the Gestalt in order to represent categorial properties[xxx]. This would give a further Husserlian support to Peirce's claim that all necessary reasoning proceeds by diagrams.

Peircean diagrams or Husserlian categorial intuitions - both point to the necessity of the direct intuitive access to ideal objects as a prerequisite to a phenomenologically conceived realism. Categories and diagrams give intuitive access to idealities and, in turn, make possible the recognition of empirical objects instantiating analogically formed properties. This points to the necessity of further investigation a de-mentalized notion of icons, of *allgemeine Imaginationen*, in all degrees of generality, and of their role in categorial fulfilment.

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[i] The references to English versions of *Logische Untersuchungen* quotes are to Findlay's translation, Husserl 1970.

[ii] Herbert Spiegelberg's pioneering 1956 article has not given rise to much further work. Here, Spiegelberg finds the following four basic agreements between the phenomenology of the two: the intuitive approach to the immediately given without preconceived theories; the disregard of questions of reality or unreality in that investigation; the radical difference between phenomenology and psychology; and the foundational role of phenomenology for philosophy and logic (182). This indeed forms a basic agreement, and as Spiegelberg says, makes it legitimate to talk both of them being phenomenologists. Spiegelberg also lists a series of points in which Peirce differs from Husserl, most notably his emphasis of the discovery of categories and the absence of intentionality as a main concern – and he concludes a brief review of the two's mutual knowledge of the other that the similarities primarily are based in their common situation: two mathematicians turned philosophers who attempt to found philosophy as a rigorous science on phenomena given in experience – in short, as two historical parallels, not unlike Newton and Leibniz. Still we will argue that considerably more similarities may be studied than the four mentioned in Spiegelberg's paper – while his basic conclusion as to mutual influence remains correct, even in the light of the further information which has appeared since his paper (NEM, *Hua* XXII, etc.).

A few further papers have commented upon the relation between the two. The fine article by Dougherty 1983 on Peirce's phenomenological defence of deduction concludes that Peirce's phenomenological approach is what allows him to articulate the "applicability of the ideal triad to the real world" due to his different notions of abstraction (cf. ch. 11), and thus reconcile formal and empirical justifications of deduction. By doing so, he has reached a result "... remarkably similar to that of Husserl." (ibid.), namely founding phenomenology as a method to attain the ideal realm of meanings.

Leila Haaparanta 2001 continues Dougherty's observation and emphazises the commonality between the two in bracketing existence presuppositions and utilizing

related abstraction methods in their research. Inspired by Hintikka, she points to a commonality in Peirce and Husserl in the analogy to geometrical method in both of them; in Peirce explicitly, of course, in Husserl, in the idea of working ”backwards” from experience – cf. Pietarinen 2004 on the importance of Peirce’s backwards, ”endoporeutic” interpretation rule for his logic diagrams.

[iii] “... durch ihre besondere Originalität, Einfachkeit und Eleganz imponiert. Sie erscheint, zumal nach der Vereinfachung, die *Schröder* ihr zuteil werden läßt, als eminent brauchbar, und es wäre demgemäß ein größerer Reichtum an sie anschließender und ausgerechneter Aufgaben erwünscht gewesen.” (43).

[iv] Peirce thus explicitly refers to Hegel for the notion, and this takes place in a period where Perice highly admires Hegel and *Phänomenologie des Geistes* especially – as against his earlier anti-Hegelianism of the 70’s and 80’s. Still, the temporal coincidence with Peirce’s acquaintance with LU is striking – just as the similarities in their way of using the concept, whereas Peirce’s ”phenomenology” has little to do with the Hegelian emergence of the Geist through history.

[v] Spiegelberg 1956 points to the fact that Peirce probably gave up ”phenomenology” for ethics-of-terminology reasons between Oct 3 1904 when he writes to James about his need to find a new term and Oct 12 the same year when he writes to Lady Welby, now using the term ”ideoscopy”. Presumably, he felt that the Hegelian use of the word were too far from his own and that Hegel must be given primacy.

[vi] Rollinger 1999 (58) relates an amusing anecdote of categorial intuition: in Husserl’s copy of Brentano’s *Vom Ursprung sittlicher Erkenntnis*, ”in the margin next to the passage where it is claimed that perceivability cannot be the same as existence since the non-real exists and yet cannot be perceived (p. 62), it is written ”categorial perception!”” - Kategoriale Wahrnehmung!

[vii] Measured against this central role in Husserlian epistemology, categorial intuition has hardly received the interest it deserves. Among the most important contributions to its clarification count the following: Sokolowski 1963, 1974, 1981; Tugendhat 1970; Lohmar 1987, 1990, 1998; Ströker 1987; Bernet 1988; Seebohm 1990; Cobb-Stevens 1990, to which I shall refer in the following. Most of these accounts aim at a reconstruction of Husserl’s views (and are very useful, even fertile in so doing) and do not attempt to go into comparisons with other accounts of the problem. I suspect, however, that such comparisons might bring us closer to the problem itself.

[viii] Husserl’s own examples of the higher-order objects grasped in categorial intution in the 6.*LI* include the identity of an object, the relation of part to whole, relations, collections, the “ideierende Abstraktion” and its intiution of essences, the determinate and indeterminate grasping of single objects (“das A”, “ein A”). Sokolowski 1981 presents a thorough analysis of the steps from an unanalyzed experience to its categorial articulation in subject and predicate. Lohmar 1998 articulates a general 3-step structure for categorial intuition: “Gesamtwahrnehmung, Sonderwahrnehmungen, kategoriale Synthesis”.

[ix] Even if ”Wesensschau” is a later term, it can be seen as a successor concept to categorial intuition, cf. Hintikka 2003, 187.

[x] This is, of course, what makes transcendental phenomenology possible as a project: the idea of taking the essences of consciousness as an object of eidetic study. It seems

possible, however, to retain the idea of the possibility of fulfilment of (certain) intentions aimed at eidetic phenomena as well as phenomenology as an anti-psychologist science of consciousness, without assuming the constitutive nature of the latter. This would preclude (or, at least, bracket) the possibility of a transcendental phenomenology, but preserve eidetic phenomenology.

[xi] Later, in his drafts of a new version of the 6th *LI*, Husserl took the position that they *always* involve such meaning, cf. Melle 2002.

[xii] "Le paradoxe est qu'une forme catégoriale signitive ne peut être remplie que par une intuition déjà elle-même catégorisée."

[xiii] We find in the three degenerate act types (imaginative, indexical, and signitive, respectively) a not coincidential parallel to Peirce's three different ways of signifying an object (icon, index, symbol). This has been noted by Münch 1993, 218.

[xiv] As is evident, this variation procedure is modeled upon function analysis in mathematics, even in Husserl's terminology.

[xv] As to the history of the concept of ontology, see Øhrstrøm et al. 2005.

[xvi] This point and its relation to the transcendence issue is not always clearly emphasized; a strong exception is Willard 1982, p. 397.

[xvii] In fact, if categoriality were identified with formal logic only, then some version of logical positivism might be the outcome. But it is not necessary to identify categoriality nor the propositional stance with language. Rather, language is one (prominent, to be sure) instrument developed on the basis of the cognitive potentials of abstraction and categoriality. A very broad definition of categoriality - comprising all higher-level acts founded on perception - is proposed in Smith (2000). Similarly, Bernet (1988) points to the fact that categoriality in general "is about the intuitive givenness of ideal objects." (33).

[xviii] The intimate connection between categorial intuition and this "theory of theories" is highlighted in Cobb-Stevens 1990.

[xix] In Peirce, this problem, of course, is solved by taking general meaning to have a continuum of merely possible (but vague) referents as its extension and his idea that generality corresponds to the possibility of chosing any one of these – close to Husserl's idea of "no matter which one".

[xx] Here, Husserl is on a par with Peirce for whom the diagram is not the particular drawing on the page nor the reader's perception of it. Peirce thus distinguishes between the diagram token - the particular drawing on the page, corresponding to Husserl's "Anhalt" - and the diagram type which we are able to grasp through a reading of that token, governed by a symbolic sign (which, in Peirce's terminology, implies generality).

[xxi] See ch. 8 and 12.

[xxii] Lohmar (1987, 1990, 1998) highlights this example in order to correct an error which Husserl himself later detects (1939). Husserl's idea in the LU was that the categorial act of collection by means of the "and" operator could only reach fulfilment by a 'reflection upon the act itself', because it is the very act that constitutes the collection of entities envisaged (all possible entities whatsoever may be so collected). As an alternative to this strange idea where the performance of an act becomes the intuition fulfilling that same

act, Lohmar points to fulfilment as *Deckungssynthesis* - covering synthesis - between partial intentions. Thus, collection would be so to speak a zero-*Deckungseinheit* and is probably involved in all more complicated acts because it simply co-localizes its entities in one and the same categorial place.

[xxiii] This corresponds to Peirce's semiotics where the classification of objects in types do not require symbols, while the opposite is the case.

[xxiv] We have already remarked that a strong case can be made that the set of possible typefaces or writing styles is so large that it cannot be exhausted by computational algorithms (cf. Hofstadter 1986; Stjernfelt 1992). Thus, the very concept of writing style cannot be the result of a variation procedure limited to computational strength. Thus it points to the fact that the variation implied in grasping essences does not always - if ever - proceed to completion through all possible variants. Rather we intuit the fact that such a variation may go on indefinitely.

[xxv] We can ask, then, what is implied in the *mere* signification of the word "steam engine", before the analogical fulfilment by the general imagination of the model? "Steam engine" is a composite noun, that is, it means an engine somehow concerned with steam. Depending on the underlying schema chosen, such an engine could work by steam, produce stem, fight against steam, etc. The syntax of noun composition only tell us it is an engine in some way concerned with steam (thus founded upon simpler signitive acts aimed at "steam", and "engine", respectively; but these are both acts concerned with general objects and thus already presupposing categoriality in the form of generalizing abstraction.). The same structure characterizes Descartes' famous "chiliogon"-example which Husserl uses to argue against the representative use of diagrams in geometry. True, we can not imagine such a figure in its complete shape, and thus the understanding of the P-S structure of the word, literally "thousand-edge", rests on our categorial understanding of the syntactical structure as well as our categorial understanding of each of the composite elements: a figure with a thousand edges. A further step in the *Erfüllungsreihe* may now prompt us to try and construct the figure in imagination. We still cannot imagine it as a figure, but we may imagine the procedure to construct it (take a rectangle and subdivide the sides until you get a number close to thousand, then add or subtract sides until you get thousand) –just like Husserl himself, when describing eidetic variation, emphasises that the imagination can not cover all cases, but we can imagine the imagination act to go on ... An contrast case is the well-known "round square" with its impossibility of intuively construing such an object. All such composite expressions prompt an *Erfüllungsreihe* prescribed both by their syntactical structure, by their founding acts. The composite noun problem forms a center of the discussion of grammatical "blending" in Turner and Fauconnier's cognitive semantics (Fauconnier and Turner 2000; Bundgaard, Østergaard, Stjernfelt, 2006).

[xxvi] However, a problem remains concerning the purely empirical species concepts. Husserl distinguishes three cases: sensuous abstraction giving sensuous concepts, categorial abstraction yielding pure categorial concepts, and a large group of *mixed* concepts (with the examples "color", "house", "judgment", "wish" for the first ones, "unity", "plurality", "connection", "concept" for the second ones, and "coloredness", "virtue", "parallel axiom" as examples for the mixed group. The latter two can of course

be seen as direct parallels to Peirce's pure and applied diagrams, respectively. Peirce also admits the existence of concepts not (yet?) analyzable in diagrams and mentions "murder" as an example. Still, even concepts as these are not without diagrammatic content. Both Husserl's "house" and Peirce's "murder" are founded concepts; both presupposes a schema of wilful, human action oriented towards a goal and towards eliminating certain factors opposing that goal (life of some person in the former case; cold, rain, theft, etc. in the latter. The reason why Peirce will not take "murder" as a diagram is that its semantics contains no rational relations. But this only implies that it is a "stiffened" diagram: it is not possible to perform any information-yielding experiments on it. But it is still a diagram in so far it is a schematic relation able to subsume instantiations by variation. Thus, I believe that the field of pure sensuous concepts is probably narrower than both Husserl and Peirce suppose; they seem to be restricted to primitive sense qualities and even then, the categorial apparatus of variation is necessary for isolating them from phenomenological experience.

[xxvii] Thus, I perfectly agree in his insistence that it is a mistake for Husserl to claim that the "vague morphologies" principally resist mathematization. It is interesting to note that this was not unanimously Husserl's contention in the first version of the LU where he still claims the ideal that "Die vagen Gebilde der Anschauung mittels exakter Begriffe möglichst deutlich zu charakterisieren, ist überhaupt eine phänomenologische Aufgabe ...", even if he immediately admits that this task "... lange nicht genug angegriffen und auch in Beziehung auf die vorliegende Untersuchungen nicht gelöst ist" (3. LU, Hua XIX, 249). The second version replaces this contention with a longer argumentation to emphasize that "Offenbar sind die Wesensgestaltungen aller anschauliche Gegebenheiten als solcher prinzipiell nicht unter "exakte" oder "Ideal-Begriffe", wie es die mathematischen sind, zu bringen." (ibid.). (Eng. "The descriptive concepts of all pure description, i.e. of description adapted to intuition immediately and with truth and so of all phenomenological description, differ in principle from those which dominate objective science. To clear up these matters is a phenomenological task never yet seriously undertaken and not carried out in relation to our present distinction"; 3. LU, vol. 2, 451).

[xxviii] Of course, discontinuous operation procedures are possible, so as e.g. the stepwise construal of . But discontinuity is dependent on continuity, Peirce would argue: the only way we are able to synthezise the single components of a discontinuous procedure into one state-of-affairs is by embedding them in a continuous space. Thus, discontinuous phenomena are always embedded into continuous ones, and discontinuous objects or calculi presuppose (explicitly or not), continuity.

[xxix] In Holenstein 1972, p. 288. Husserl's argument is built on §22 in LU 3, where he notes that not every whole requires a specific moment of unity, only the "zerstückbare" require that. All really uniting consists of relations of foundation, and unity is a categorial predicate, on the one hand, at the same time as this unity is given directly, sensuously in Gestalts.

[xxx] This fact is, of course, what gives rise to the attempts at finding a vocabulary of simple schemata, so as e.g. the "kinaesthetic image schemas" of Lakoff 1987 or the schemata in Peruzzi 1999. The precise amount of such schemata which the human mind

is able to process is no doubt governed by empirical psychological regularities - but an a priori, phenomenological corollary is that *any* possible mind will have to do with some finite vocabulary or other of such simple diagram atoms. This will, in fact, be the phenomenological equivalent of the impossibility of "intellectual intuition": if we possessed such a faculty, infinitely complicated diagrams would be possible to process in one glance.