

The Problem of the Unity of a Manifold in the Development of Husserl's Philosophy



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1 Introduction

Husserl's most systematic phenomenological work, *Ideas for a Pure Phenomenology and Phenomenological Philosophy. First Book: General Introduction to Pure Phenomenology (Ideas I)* (Husserl, 2014), differentiates pure transcendental phenomenology, as an eidetic science, from the eidetic science of mathematics.¹ In line with the tradition of transcendental philosophy arguably—*ante rem*—stretching back to Plato, Husserl contrasts transcendental phenomenology with mathematics and argues that its conceptuality cannot be appropriately articulated and conceived in analogy with mathematics. While both mathematics and transcendental phenomenology are eidetic sciences, phenomenology “belongs to a basic class of eidetic sciences ... [that is] totally different from that to which the mathematical sciences belong” (Husserl, 2014, 136). The key differential between these two sciences on Husserl's view concerns the nature of the essences that are the subject matter of each discipline. Mathematics deals with exact essences, which he characterizes as ideas in the Kantian sense. Phenomenology deals with inexact essences, which Husserl characterizes as morphological.

Significantly, Husserl formulates the precise issue of the difference between the two kinds of essences at issue here in terms of the answer to the question: “Is the stream of consciousness a genuine mathematical manifold (*Mannigfaltigkeit*)?”²

¹Husserl defines an “eidetic” science as “a science of essences” in contrast with a “science of matters of fact”, such as empirical psychology (See Husserl, 2014, 5).

²The term ‘manifold’ (*Mannigfaltigkeit*) as employed by Husserl has a range of meanings, all of which are related to the basic phenomenon of, on the one hand, a multitude (*Menge*) of items, and, on the other, their unity (*Einheit*). Multiplicity (*Vielheit*), collection (*Kollektivum*), totality (*Inbegriff*), are closely related terms and generally used by Husserl with the same intended mean-

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(Husserl, 2014, 132). His answer is “no.” The discussion to follow will focus on Husserl’s distinction between a mathematical and a phenomenological manifold in light of the development of his thought, together with an invariant problematic running through most of it, which is behind that distinction. For the purposes of this discussion, Husserl’s development will be divided into three phases: (1) the early descriptive psychological account of mathematical manifolds, (2) the pure transcendental phenomenological account of mathematical and phenomenological manifolds, and (3) the transcendental phenomenological account of the historicity of the different meanings determinative of both kinds of manifolds. The invariant problematic running through the second and third phases of the development of Husserl’s thought, the phenomenological account of the unity and multiplicity proper to the manifold of internal time consciousness, will also be discussed.

My discussion will endeavor to show that Husserl’s phenomenological account of the formal structure of a mathematical manifold does not adequately distinguish the formality of meanings that are ideal from that of those that are formalized. Symptomatic of this is Husserl’s use of the term “formal,” which refers to both ideal and formalized meanings in a manner suggesting that they share a common essential structure of “formality.” That they do not will be shown to be an important implication of Husserl’s phenomenological analysis of the constitution of ideal—in the sense of “ideas in the Kantian sense”—and formalized—in the sense of symbolic mathematics—meanings. Two phenomenologically significant consequences will be drawn from this.³ On the one hand, Husserl’s account of a mathematical

ing, which is, again, the presentation of a phenomenon that is essentially characterized by more than one item that is nevertheless somehow unified as a whole or a totality. The technical, formalized mathematical meaning of ‘manifold’, discussed below, of course also figures in Husserl’s use of the term, and is clearly what is meant in this quote.

³Husserl consistently distinguishes formalized universality from generalized universality and the processes of formalization and generalization constitutive of them (Husserl, 2014, 27). On the one hand, generalized universality manifests the hierarchical structure of meanings constitutive of the material regions of being, from a given region’s highest genus down to the infima species determinative of the meaning of the manifold of individuals that instantiate the material region. Husserl characterizes the process of generalization that constitutes generalized meanings in terms of the variation that begins with examples drawn from factual (*faktisch*) experience and culminates in the imaginative variation that yields the essence of the various levels of generic universality (Husserl, 1973, 339–364, 1977, 53–63). On the other hand, Husserl characterizes formalized universality in terms of the non-hierarchical universality of the formal region “any object whatever” (*Etwas überhaupt*), which encompasses—without being reducible to—the generalized universalities constitutive of the meaning structure of the material regions of being. Husserl mostly characterizes the process of formalization in terms of the “emptying” of material meaning from generalized universal meaning structures, a process that is then sharply distinguished from the variation operative in the generalization that yields generalized universality (Husserl, 1973, 357). But he sometimes also characterizes formalization in terms of variation (Husserl, 1969, 249, 306). While Husserl is quite clear that the essential forms of meaning that characterize generalized and formalized universality do not share a common genus (Husserl, 2014, 27), in the case of the essential forms of meaning characteristic of ideas in the Kantian sense and formalized universality, Husserl often speaks as if both shared the essential commonality “ideal.” That they cannot do so on grounds intrinsic to Husserl’s own phenomenological analysis, will be shown in Sect. 8 below.

manifold will be shown to be problematical, insofar as that account has a dimension that is determined by a logical norm rather than a descriptively constituted *eidōs*. This is, of course, problematical, because phenomenology as a descriptive eidetic science cannot legitimately base its cognition, without more ado, on the appeal to norms, logical or otherwise. In the case at hand, its cognition must rather provide an account of a mathematical manifold that is based in the cognition of its descriptively constituted *eidōs*. On the other hand, Husserl's account of the constitution of the temporal foundation of the manifold that composes the stream of consciousness will be shown to be crucially determined by the appeal to eidetic structures whose formal conceptuality is mathematical rather than phenomenological. That is, Husserl's account of the formal unity and multiplicity constitutive of any given phenomenological manifold does not adhere to the distinction between a mathematical and phenomenological manifold presented in *Ideas I*. Hence, the formal character of the concepts Husserl employs to account for the unity of a phenomenological manifold—that is to say, their formal “conceptuality”—are mathematical, not phenomenological.⁴ This is, of course, therefore inconsistent with the *eidetic* distinction Husserl himself draws between mathematical and phenomenological manifolds.

Once this is established, a detailed account of the phenomenological shortcomings of Husserl's employment of exact mathematical concepts to characterize the constitution of a phenomenological manifold will be provided. Its focus will be on the inability of the mathematical concept of a continuum⁵ to account for the phenomenal *discontinuity* of the past from consciousness of present, both in the case of the manifold streams of consciousness that begin and end and the foundation of those manifolds in the living present. This discontinuity will be shown to be manifest in the phenomenon of *forgetting*, which Husserl's appeal to the “law of modification” to account for the retentional and protentional flow of consciousness as a continuum is unable to account for. The connection between sedimentation and

⁴Mark van Atten (in an email exchange) pointed out to me that “Husserl realizes (at least sometimes) that in his account [of the manifold of time] the mathematical is an idealization—see the *Bernauer Manuskripte*, Hua XXXIII, p. 66 line 16, p. 307 lines 16–18.” In the first instance, the idealization in question concerns the ideal givenness of the limit of the modification responsible for the generation of the temporal manifold, insofar as its retentive flow fades into the infinite “in [a] mathematical idealization (my translation).” In the second, Husserl characterizes the duration of time—as the summation of concreta—in terms of “a performance that is ordered formally and systematically” and thus the “matter of a mathematical technique (my translations).” While these appeals of Husserl to mathematical idealization and mathematical technique are doubtlessly related generally to the question of the role of the mathematical in his account of the manifold of time consciousness, it is important to note that what I wish to call attention to here is *not* Husserl's idealized mathematical characterization of the extension of the concrete manifold of consciousness qua its flowing or streaming. Rather, what I want to point out is that Husserl's account of the very genesis of this streaming—which according to his presentation of the phenomenological method must have *constitutive* priority over its putative formal structure—already employs the (exact) formal conceptuality of mathematics. See below, Sects. 14, 15, and 16.

⁵“The running-off continuity of an enduring object is therefore a continuum whose phases are the continua of the running-off modes belonging to the different time-points of the duration of the object” (Husserl, 1991, 30).

forgetfulness made by Husserl in a late manuscript will provide the occasion to articulate the horizons of four future tasks for phenomenology: (1) investigate the role of the phenomenon of forgetfulness in the constitution of both internal and historical time consciousness; (2) reassess Husserl's account of recollection in making present transcendent objects in the living present, in light of the discontinuity of the horizon of the past from that of the present; (3) investigate the role of sedimentation, forgetfulness, and recollection in the constitution of the unity and multiplicity of the manifolds of consciousness that begin and end; and (4), investigate the intentional-historical meaning that is sedimented in the origins of the universal formalization that is the *sine qua non* for a mathematical manifold in contemporary mathematics.

2 The Collective Unity of a Manifold and the Formalized Unity of Its Units in Husserl's Early Work

The unity of a manifold emerges as a problem in Husserl's thought within a specifically mathematical context (*Philosophy of Arithmetic, PA*) (Husserl, 2003). The manifold in question is a multitude of discrete units whose unity is irreducible to either any property (or properties) of the individual units or to their simple aggregation. Because of this, the unity in question is termed "collective," in the precise sense of its capacity to unify the discrete units that compose a multitude into a whole while being neither a property of any one of the individual units nor of their aggregate; *and* to do so without the collective unity itself being predicable of any individual unit. The specific problem here is that of accounting for the peculiar *collectivity* of the unity in question. This is a problem given the inability of the whole-part structure of individual objects and their aggregation to account for it. This is to say that neither an account of the whole-part unity of each *individual* object, nor the unity of anything that can be predicated of such objects, can address, let alone account for, the collective unity that composes the collection of such objects.

The nature of this problem has a mathematical context, because the most basic objects of mathematics—natural numbers beginning with two—are characterized by their collective unity, which determines exactly how many units each specific number is composed of. Each number unifies collectively an exact amount of units, no individual unit of which is intelligible as a numerical entity, because only as a collection do the units belong to the number that determines their amount. For instance, the first number, "two," is composed of a unit *and* a unit, each of which is one, not two. Their exact amount—"two"—is therefore not predicable of either unit taken in isolation but only when both units together are part of the collection whose amount is "two." Despite the mathematical context of this problem, however, addressing it is not a mathematical but a philosophical one. This is the case not only because mathematical knowledge and the cognition behind it are perfectly capable of realizing themselves without philosophical reflection upon their basic objects and

concepts, but also because at issue in the foundation of collective unity is the intelligibility of the most universal and most fundamental phenomenon available to human understanding. "Every complex phenomenon which presupposes parts that are separately and specifically noticed, every higher mental and emotional activity, requires, in order to be able to arise at all, collective combination of partial phenomena" (Husserl, 2003, 75). Moreover, "simple relations (e.g., identity, similarity, etc.)" (ibid.) could not be presented "if a unitary interest and simultaneously with it, an act of noticing did not pick out the terms and hold them together as unified" (ibid.).

Another foundational issue arises here: the formal categorial structure of the concept of a unit is such that any arbitrary object from any domain of being whatever—perceptual, conceptual, imaginary—can fall under it. But again, the problem is one whose scope is not limited to a multitude composed of the arbitrary objects unified by number and therefore to mathematics. In this case, the problem is that of foundation of the intelligibility of the most basic concept of logic, that of the materially empty and therefore formalized category of "anything" (*Etwas*).

3 The Failure of Husserl's Descriptive Psychological Account of the Objectivity of the Collective Unity of a Manifold and Its Formalized Units

Husserl's attempt to account for the philosophical foundation of the intelligibility of natural numbers addressed both the objectivity of the collective unity and the formalized unity of the individual units that compose the collectively unified multitude determinative of number. That is, for Husserl accounting for the intelligibility of number involves the answer to two questions. One, what is responsible for the peculiar unity of the units it unifies, given their materially empty and therefore formal universality? Two, how is it possible that a multitude of such units are unified as a *multiplicity* whose unity is neither derived nor derivable from the unity of each of the units belonging to their multitude, but that, as such, is nevertheless able to encompass them all? Husserl's early work, however, attempted to account for this within the context of the method of descriptive psychology, which focused on the psychological acts in which each kind of objectivity is given. In the former case, the act in question was that of collective combination, wherein the items in a multitude are successively combined into a unity, with the acts in question being indicated by the word "and." In the latter case, the act in question was that of the presentation (*Vorstellung*) in which any object of perception is given. In both cases, the descriptive psychological account of the inner perception (or, equivalently, reflexion⁶) of

⁶"Reflexion" is preferable to "reflection" for translating the German word "Reflexion" within the context of Husserl's early work under discussion here. That work was informed by the Empirical account of the opposition between inner and outer perception, neither of which involved or other-

the acts in question was supposed to be capable of abstracting from the contents of the acts the objective meanings in question. In the acts of collective combination, the objectivity of the ‘collective unity’ is at issue and in the acts of perceptual presentation, that of the formal category of ‘anything’ is at stake. But as Husserl himself soon came to realize, from the inner perception of or reflexion on the psychological acts all that can be abstracted is the concept of the act in question and not the objective unity given in it.⁷ The method of descriptive psychology therefore was rejected by Husserl, because it is incapable of providing the philosophical foundation for the collective and formalized unities that make intelligible the whole-part structure of the exact meaning of the natural numbers.

The fallacy of “psychologism” at issue in Husserl’s initial foray into the foundational problems connected with the most basic objects of mathematics, it is important to note, however, was not the logical variety that claimed that the exact meanings in question are in truth really psychological realities. That is, it wasn’t the kind of psychologism that Husserl criticized in the *Prolegomena to the Logical Investigations* (Husserl, 1970a). Rather, despite being fully aware of the non-psychological basis of the objectivity of the collective unity and the formal category of ‘anything’ (*Etwas*), Husserl’s initial approach to accounting for their foundations nevertheless sought to ground the *origin* of that objectivity in the description of its psychological genesis.

It’s important to note here, because it is often not recognized, that the philosophical problem of accounting for the foundation of the collective unity of a multitude and the formalized category determinative of its units remained a problem for Husserl’s thought subsequent to his rejection of the psychological method he had initially employed to address it. Thus, after Husserl’s rejection of the act of collective combination as the source of the objectivity of the collective unity of a manifold, accounting for that unity’s foundation remained a problem for his thought.⁸ Likewise, the problem of accounting for the philosophical foundation of the formalized category of ‘anything’ also remained after his rejection of the descriptive psychological account of that category’s origin.

wise presupposed what Husserl would later characterize as the “thematic” mode of conscious awareness that is intrinsic to, for instance, the meaning of the English term “reflection.”

⁷In 1913 Husserl concluded, “from the reflexion on acts” of collecting “the concept of collecting ... is all that can result” (Husserl, 1975, 127) and therefore not the concept of the unity of the collection.

⁸See (van Atten, 2013) for a recent phenomenological attempt to account for this unity on the basis of the objectivation of the temporal form of the pre-given absolute flow of consciousness.

4 Husserl's Self-Critique of the Descriptive Psychological Account of the Logical Foundation of Symbolic Mathematics

What's behind the lack of recognition noted is Husserl's response to the second foundational problem in mathematics he sought to address in his early work. Namely, the foundation of the logic that allows both the blind manipulations of meaningful symbols and the use of meaningless symbols as if they had a meaning to achieve mathematical cognition. Husserl sought to establish the foundation of this logic by appealing to an understanding of "symbol" that took it to be a surrogate for the presentation of genuine mathematical objects. The genesis of symbolic surrogation on this view involved three crucial steps. One, the idealizing extension of the mind's finite powers of apprehending large and indeed infinite mathematical objects. Two, the substitution of sense perceptible signs for the idealized concepts generated by this idealization. And three, the manipulation of those signs according to other signs that express algorithmic rules for their combination and separation in the complete absence of any reference to the following: both the idealized concepts the signs that are the substitutes for and the original mathematical objects of which those concepts are the idealized extensions.

Husserl's account of the third step in his first book, *Philosophy of Arithmetic* (Husserl, 2003), led him to realize that the descriptive psychological thesis of the surrogative function of symbols in relation to the concepts of mathematics that had guided that book's account of the foundation of the logic of symbolic mathematics was wrong.⁹ As Husserl related it in his famous letter to Karl Stumpf (Husserl, 1994, 12–19) (written after the book's completion), symbolic mathematics "is not a matter of the 'possibility' or 'impossibility' of concepts" (Husserl, 1994, 16), but "an accomplishment of the signs and their rules" (ibid.). Husserl concluded that symbolic mathematics, therefore, is "no science, but a part of *formal* logic" (ibid., 17), albeit a part that doesn't yet exist, as he knew "of no logic that would even do justice to the possibility of ordinary arithmetic" (ibid.).

5 Husserl's Account of Categorial Unity of Numbers Does Not Account for the Objectivity of Their Collective Unity

Husserl's next book, *Logical Investigations (LI)* (Husserl, 1970a), sought to lay the groundwork for formal logic, one that would include the capacity to account for the foundation of both the objectivity of natural numbers and the logic of symbolic mathematics. However, readers searching for non-psychologistic solutions to either of the two foundational issues raised in Husserl's earliest work will search in vain.

⁹See (Willard, 1980) and (Hopkins, 2011a, b, Ch. 13).

Regarding the foundation of the objectivity of the natural numbers (beginning, as noted above, with the number two), Husserl included the species of those numbers among the categorial objects whose objectivity the breakthrough discovery to pure phenomenology—categorial intuition—was tasked with providing non-psychological perceptual access. Thus, for instance, in the case of the number five, the multitude of objects that compose that exact number were said to be “instances” of the categorial species “five,” whose objective unity is given as an ideal object that is irreducible to the psychological experience in which it is given. However, the question of the source of the ideal givenness of the collective unity of the multitude that composes any instance of the objective species “five” is nowhere addressed in that work nor anywhere else in Husserl’s account of categorial intuition in general. Husserl, in fact, notes explicitly in the *LI* that its investigations do not explore the foundation of the categorial unity of “*collectiva*.”¹⁰

6 Husserl’s Phenomenological Account of a Definite Mathematical Manifold

With regard to the foundation of the logic of symbolic mathematics, what Husserl presented in the *LI* (Husserl, 1970a, §§ 69–70) proved to be the basis of his definitive account of that logic, namely, his definition of a mathematical manifold.¹¹ Termed a “definite manifold” or “mathematical manifold in the precise sense” in *Ideas I* (Husserl, 2014, 130), this account of the logic of symbolic mathematics remained the basis of his account of that logic in his later published works, *Ideas I* and *Formal and Transcendental Logic (FTL)*. The logic in question has its basis in a finite system of axiomatic propositions and axioms that completely and univocally encompass the essence of a given mathematical domain (e.g., that of Euclidean geometry). As a result, every proposition formed from this finite set of propositions and axioms—no matter what its logical form—is either a formal logical consequence of them or their formal logical contradiction. In addition, this account of a definite or precise mathematical manifold also characterizes for Husserl the manifold that ensues when the material particularization of all the special domains of mathematical objects is subject to formalizing universalization. What then results is

¹⁰In § 51 of the *LI*, “*Collectiva and Disjunctiva*,” Husserl calls attention to the lack of sensible perception of the collectivum and the “unitary object which corresponds” to the “act of collection.” However, significantly, he does not provide a foundational account of the objective unity of that object, but instead refers to the investigations in his *Philosophy of Arithmetic* of the signitive reference to a multitude that “does not therefore as yet possess the character of a genuine intuition of the collection as such” (Husserl, 1970a, 799).

¹¹In *FTL* (Husserl, 1969), 29 years after the publication of *LI*, Husserl quotes extensively from § 70 of *LI*, noting that “I shall repeat here the strict characterization of the idea of a formal theory of theory forms—correlatively, a formal theory of manifolds. I cannot improve on it” (Husserl, 1969, 91).

the *pure* definition of a mathematical manifold, which accounts for the specialized logical form of any symbolic mathematical manifold whatever.

7 Fundamental Phenomenological and Logical Problems with Husserl's Account of Definite Mathematical Manifolds

There are two fundamental problems with Husserl's account of both specialized and pure mathematical manifolds, one that is based in his account of the difference between mathematical and phenomenological manifolds and the other in the development of the logic of mathematics in the early twentieth century.

The first problem is that Husserl's definition presupposes the possibility of a system of formalized axioms encompassing both the essence of the *objects* of the various specialized mathematical domains as well as the *forms* of the axioms of any such specialized domain. This possibility, however, is not established *phenomenologically* by Husserl. That is, Husserl nowhere provides concrete *descriptive* analysis of the morphological (*inexact*) essence or essences of the *genesis*¹² of formalized mathematical axioms and the propositions formed on their basis that refer adequately to (or otherwise denote): (1) the essence of either a given specialized domain of mathematical objects, or; (2) the essence of the forms of the axioms of any specialized domain of mathematical objects whatever. On the one hand, (1) would require a foundational phenomenological account of *both* the essence of a given

¹²The paradox of a phenomenological account of the descriptive "essence" of mathematical—and therefore exact—cognition that would employ inexact essences, per Husserl's *Ideas I* account of phenomenology as a descriptive eidetic science, disappears when it is considered that Husserl's original foundational engagement with mathematics in *PA* was concerned with the genesis of symbolic mathematical cognition. The radicality of that concern and the problem of the foundation that characterizes what Husserl would later (in *FTL*, with explicit reference to *PA*) term the "constitution" (Husserl, 1969, 87) of the intelligibility proper to formalized mathematics, prevents accounting for the "essence" of the genesis of exact mathematical structures on the basis of essences that are themselves already exact. The paradox, then, is that the phenomenological essence of the genesis of the exactness of formalized cognition cannot itself be exact, because precisely what is at stake in that essence is an account of the origin of the peculiar exactness of formalized cognition. In other words, if—per impossible—the origin of exactness was already exact, it wouldn't properly be an origin. In this connection, it is interesting to note that Husserl's pure phenomenological distinction between "static" and "genetic" phenomenological approaches to the problem of phenomenological constitution reintroduced his original concern with the problem of genesis in *PA* into his transcendental phenomenology. It is also interesting to note that his concrete genetic analyses (both published and unpublished) did not return to the original problem of the genesis of symbolic mathematical cognition. Only in his final texts, so-called *Crisis* texts, did he return to this problem, albeit significantly in those texts the transcendental phenomenological problem of genesis was connected, on essential grounds, with the problem of the historicity inseparable from the genesis of the essence of the exact meanings constitutive of symbolic mathematics, and the mathematical concept of a manifold determinative of that mathematics.

specialized domain of mathematical objects *and* of its *specialized* axiomatic formalization. On the other hand, (2) would require a foundational phenomenological account of the *universal* formalization of the formalized axioms of the various specialized domains of mathematical objects.

As Dieter Lohmar (1989, 191ff) and most recently Thomas Seebohm (2015, 207) have shown, the context for Husserl's definition of a definite manifold was not only Hilbert's mathematical notion of axiomatic completeness, but the fact that Husserl accepted that notion as both mathematically and logically sound. Soon after Husserl published *FTL* Gödel proved that not all formalized axiom systems in mathematics are complete ("definite" or "precise" in Husserl's terminology), from which it follows that the universal scope of Hilbert's logical norm of axiomatic completeness is not well-founded mathematically. This development in logic renders Husserl's phenomenological account of a mathematical manifold problematic.¹³

8 Equivocation of Ideal and Formalized Meanings in Husserl's Account of the Mathematization of Nature

Husserl's pre-*Crisis* account of the formalized objectivity constitutive of mathematics is both sparse and inconsistent. He sharply distinguishes formalized universality from generalized universality and the processes of formalization and generalization constitutive of them (Husserl, 2014, 27). On the one hand, generalized universality manifests the hierarchical structure of meanings constitutive of the material regions of being, from a given region's highest genus down to the infima species determinative of the meaning of the manifold of *individuals* that instantiate the material region. Husserl characterizes the process of generalization that constitutes generalized meanings in terms of the variation that begins with examples drawn from factual (*faktisch*) experience and culminates in the imaginative variation that yields the essence of the various levels of generic universality (Husserl, 1973, 339–364, 1977, 53–63). On the other hand, Husserl characterizes formalized universality in terms of the non-hierarchical universality of the formal region "any object whatever" (*Etwas überhaupt*), which encompasses—without being reducible to—the generalized universalities constitutive of the meaning structure of the material regions of being. Husserl mostly characterizes the process of formalization in terms of the "emptying" of material meaning from generalized universal meaning structures, a process that is then sharply distinguished from the variation operative in the generalization

¹³For comprehensive discussions of the implications of Gödel's incompleteness theorems for the concept of *mathematics* that guides Husserl's account of a definite manifold, see (Okada, 2002) and (van Atten, 2022).

that yields generalized universality.¹⁴ But he sometimes also characterizes formalization in terms of variation.¹⁵

In the *Crisis* Husserl tends to equate the mathematization of nature with its idealization (Husserl, 1970a, b, 23, 35, 66, 301). Husserl's traces this tendency to Galileo's employment of the exact essences of Euclidean geometry to *idealize* both the primary and secondary qualities of the cognition of sensible bodies (Husserl, 1970b, 35). Hence, in Husserl's account the process of mathematization *per se* is not always distinguished from its idealizing origins. This is the case despite the fact that Husserl himself recognized that the mathematization initiated by Galileo did *not* employ the formalized symbolic mathematics invented by François Vieta's analytic method (pure algebra) (Husserl, 1970b, 44). Moreover, Husserl recognized that the implicit "arithmetization of geometry" (*ibid.*) and mathematics generally—made possible by Vieta's analytic innovation—led to the formalization of mathematical manifolds (Husserl, 1970b, 45). The latter formalization, then, is what leads for Husserl to the radical "emptying" (Husserl, 1970a, b, 44, 46)—by mathematization—of the intuitive meaning inseparable from the ontology of the life-world.

That said, however, Husserl's account in the *Crisis* of the constitution of the objective meaning operative in the mathematical sciences employed in the service of modern physics' mathematization of nature goes beyond his pre-*Crisis* accounts in two crucial regards. One, the condition of possibility for the constitution of the objectivity proper to the *exact* meaning operative in mathematical physics is tied to history, insofar as the handing down by tradition of such meaning is explicitly recognized by Husserl as a *sine qua non* for its *objective* constitution (Husserl, 1970b, 369). Two, Husserl's recognition of the *historicity* of the foundational meaning of the exact sciences (and its transmission by tradition) has as its condition of possibility the phenomenon of *sedimentation* (Husserl, 1970b, 362).¹⁶ Thus, the constitution of the meaning of the exact sciences cannot be reduced or otherwise be traced back to the intentional modifications of perception, as Husserl had thought prior to the *Crisis* (Husserl, 1969, 158). And, indeed, it cannot be so reduced even if such modifications are understood to extend beyond that of merely subjective to the

¹⁴"But formalization is something essentially different from variation. It does not consist in imagining that the determinations of the variants are changed into others; rather, it is a disregarding, an emptying of all objective, material determinations" (Husserl, 1973, 359).

¹⁵See *Formal and Transcendental Logic*, where Husserl explicitly connects the constitution of "analytico-formal universalities" (Husserl, 1969, 249) to "phantasy variation" (*ibid.*). See also (*ibid.*, 306).

¹⁶Husserl's last writings introduce the radical claim that "history is from the start nothing other than the vital movement of the coexistence and interweaving of original formations and sedimentations of meaning" (Husserl, 1970b, 372). By "sedimentation" Husserl means "the constant presuppositions" of the scientist "of his constructions, concepts, propositions, theories," such that these "mental products" take on "the form of persisting linguistic acquisitions, which can be taken up again at first merely passively and be taken over [merely passively] by anyone else" (Husserl, 1970b, 52). Husserl speaks in this context "about the possibility of complete and genuine reactivation [of the sedimented meanings] in full originality, through going back to the primal self-evidences, in the case of geometry and the so-called 'deductive' sciences" (Husserl, 1970b, 365).

intersubjective constitution of perception (Seebohm, 2015, 187). Thus, as the original editor of Husserl's core *Crisis* texts, Eugen Fink, reflected in the subtitle he added to Husserl's "Origin of Geometry," the function of sedimentation in the constitution of the objective meaning of geometry, and, by extension, of the exact sciences in general, exhibits an "intentional-historical" (Husserl, 1970b, 353) dimension.

Husserl thus saw in the *Crisis* that the formalization of meaning presupposed by modern mathematics is inseparable from its institution in an intentional-historical process. This formalization cannot be accessed by the empirical methodology employed by the positive science of history (Husserl, 1970b, 371). The conceptual suppositions behind the method and facts established by empirical history on Husserl's view make it blind to the region of the formal concepts that compose the mathematical objects of modern algebra and the analytic conceptuality generally that is constitutive of modern mathematics. And empirical history's explanatory methodology, rooted in the notion of efficient causality as the engine that drives historical change, is incapable of accounting for the kind of change that occurs in the historically dated conceptual transformations at issue in the history of ideas. It is precisely the latter kind of change, operative in the mathematization of nature initiated by Galileo, that Husserl sought to account for in the *Crisis* by aligning transcendental phenomenology's epistemologically foundational concerns with historical reflections whose quarry is not historical *facts* but the historically dated origins of the exact meanings that are both presupposed by and that drive the exact sciences (Husserl, 1970b, 72, 370).

As already mentioned, despite recognizing the distinction between the idealized conceptuality of Euclidean geometry and the formalized conceptuality of algebra and symbolic mathematics generally, Husserl was wont to use the terms "mathematization" and "idealization" interchangeably. Moreover, notwithstanding, as already mentioned, his attentiveness to the arithmetization of geometry responsible for the primal institution of formalization and the intuitive emptying of the life-world inseparable from the conceptuality of formalized mathematics, Husserl himself never analyzed the epistemological-historical origins of formalized mathematics.

9 Phenomenological Manifolds in Husserl's Pure Transcendental Phenomenology

Husserl's phenomenological account of the manifold of the stream of consciousness has its basis in the reflective thematization of the subjective experience in which the objective identity of the things in the world and the world itself as their horizon appears. Prior to the methodological intervention requisite for the phenomenological description of the stream of consciousness, the objective identity of things and the world horizon appear directly, without any explicit awareness of the subjective experience that is disclosed by phenomenological reflection to be a condition for the

appearing of objectivity as such to consciousness. This phenomenological reflection thematizes the subjective experience in which the objective identity in question appears. As thematized, the experience in question itself *appears*, and does so as the *manifold* of perspectives that are conscious of the objective identity of both the things in the world and their worldly horizon. These latter, in turn, *appear* as *unities* that stand out from the multiple perspectives directed to the unity of each that composes the manifold stream of consciousness.

The manifold of perspectives thematized by phenomenological reflection pertains to what Husserl terms the “eidetic singular” (Husserl, 2014, 26), which is an essence’s lowest specific difference. What is singular here is precisely the flowing perspectives that compose the manifold as a *concretum*, that is, the essence of that dimension of subjective experience that is “absolutely independent” (ibid., 30) of any other essential determination. The descriptive articulation of the essence of the concretum brings to the fore the objective unity of the thing that appears in the flowing perspectival appearances. The latter *flowing* of experience cannot be “conceptually and terminologically” (ibid.) secured. Rather, only “the essential content in the fullness of its concreteness” can be so secured and thus cognized eidetically. Hence, while there can be “no talk of a univocal determination of *eidetic singularities*” (ibid., 135), in this case, of all that belongs to the flowing manifold of consciousness that composes the essence of the subjective stream of experiences in which objective identities appear, the content of that essence *itself* can be taken as something univocal. Namely, “as an ideally identical essence that, like any essence, could be instantiated, not only *hic et nunc* but in countless exemplars” (ibid., 134). In the case at hand, it can be instantiated in any arbitrarily given reflectively thematized subjective experience in which the unity of objective identity appears.

Presumably, the “essence” at issue in the phrase “like any essence” here refers to the non-exact, descriptive essences that are the concern of the eidetic science of phenomenology. Thus, for instance, the account of the manifold perspectives of the subjective experience in which the unity of the identical object appears through its flowing is descriptive, since flowing does not appear as the specification of an essence with the characteristic of an Idea in the Kantian sense. The essential status of ‘flowing’, therefore, is not—*per impossibile*—that of a moment in the extension of experience inseparable from the passage to an exact (and therefore) mathematical limit. Rather, ‘flowing’ is an instance of the ideally identical descriptive essence of *any* arbitrarily given subjective experience in which the appearance of the unity of the objective identity of things and the world horizon appears.¹⁷ As the instance of

¹⁷The question whether Husserl’s account of the ideally identical character of the descriptive essence, whose status is *inexact* according to Husserl’s *eidetic* distinction between the exact status of mathematical essences and the morphological status of phenomenological essences, tacitly presupposes the *idealization* in some sense of the descriptive essence, cannot be addressed here in detail. What can be remarked here, however, is that the status of the *ideality* of the descriptive essence for Husserl is radically different from that of the mathematical essence. It is so, above all, because the *ideality* of the latter but *not* the former requires for its constitution the passage to a limit that according to Husserl is essentially characteristic of mathematical exactness. To the extent that Husserl’s phenomenological account of the descriptive essence is not just terminologically but

an essence, ‘flowing’ therefore does not refer to anything individual according to Husserl, that is, to something whose unity is empirically determined and therefore contingent, because as contingent it can always appear otherwise.

10 The Constitution of Internal Time Consciousness

The flowing manifold of the stream of subjective experience exhibits a phenomenological unity, which according to Husserl is constituted in “internal time consciousness.” The meaning of ‘internal’ here is initially developed in contradistinction to the time of the clock, so-called “external” or “objective” time. However, the subjectivity of Husserl’s account of time consciousness and the temporality constituted therein is in no way opposed to the time of the object. Rather, it is tasked with presenting the constitution of the unity of the object’s presentation *as objectively present* in subjective experience from *within the temporality of that experience’s flowing manifold*. This is the case, because subsequent to the *epoché*, the ontological opposition between the perception of “inner” and “outer” objects is transformed into the transcendental distinction between the constitution of “immanent” and “transcendent” meanings (*Sinne*). The constitution of the unity of the latter meanings, therefore, cannot be accounted for in an opposition between the manifold of the stream of consciousness and the unity of an object external to it, but rather, it must be sought precisely in the phenomenon of the flowing manifold itself. This is to say, the phenomenological unity of the immanent and transcendent meanings must be sought within the manifold that composes the stream of consciousness.

Husserl’s phenomenological account of the temporal unity of the manifold of consciousness tracked the development of his phenomenology from “static” to “genetic.” On the one hand, the static account employed the perceptual presentation of the transcendent object and the unity of its meaning as the “guiding” clue to account for the constitution of the temporal unity of the manifold of consciousness. On the other hand, the genetic account sought to account for the constitution of the immanent unity of the temporal manifold of consciousness itself on the basis of syntheses of consciousness that are both passively given *and* pre-objective. Both accounts apply the same correlation between the three phases of time consciousness—retention, primal impression, and protention—to the temporality of objective presentation, i.e., past, present, future. In the static account, this correlation is presented by Husserl as the essence of the temporal unity of the finite streams of consciousness that come and go (Husserl, 2014, 157). In the genetic account, the correlation is presented as the essence of the absolute, pre-objective and

also substantially related to both the status and controversy over the true being of the *eidê* in Plato and Aristotle—and that extent on my view is considerable—the definitive answer to this question requires the disambiguation of that status and controversy which is sedimented in Husserl’s self-interpretation of phenomenology as an *eidetic* science. (For a detailed discussion of this, see Hopkins, 2011a, b, especially 21–82 and 254–272.)

unobjectifiable, standing-streaming origin of the living-present wherein appear and disappear the manifold finite streams of consciousness.

11 Husserl's Static and Genetic Accounts of the Constitution of the Temporal Unity of the Ego

The methodological commitment of transcendental phenomenology to account for the unity of the phenomenological manifold without appeal to objects or objective meanings that do not have their source in the *transcendental* immanence of that manifold, as has been remarked often enough, is broken by Husserl's Cartesian self-interpretation of the phenomenological manifold's subjectivity. For my purpose, only the implications of this for his account of the unity of the phenomenological manifold will be taken up. These implications concern Husserl's account of the static and genetic constitution of the unity of the transcendental Ego as an object immanent to the phenomenological manifold.

In the case of Husserl's static account of the Ego's unity, that unity is accounted for as a *pole* that underlies the manifold flowing perspectives of the stream of consciousness, which are intentionally directed to the unity of the meaning of the transcendent object. As such, the Ego's unity, as a pole, is constituted in opposition to the objectivity of the meaning of the transcendent object, which is itself characterized by Husserl as a *pole* whose unity underlies—in the technical sense of transcending—the manifold perspectives in which it appears to consciousness. Husserl's static account of the constitution of the Ego's unity is therefore dependent on it being posited in opposition to the unity of the object's meaning as transcendent. One consequence of this is that the constitutive account of its unity as an object immanent to the phenomenological manifold is derivative. It is derivative in the precise sense that the account of its unity as a pole presupposes that of the objective pole to which it is opposed in Husserl's descriptive account of its unity.¹⁸

Husserl's genetic account of the Ego's unity recognizes that because the Ego's static unity as a pole belongs to the stream of consciousness, its unity as an enduring identity in the *temporality* of the flowing of that stream is something whose constitution must be accounted for in terms of its genesis in that temporality. The static account of the Ego's unity is limited in this regard, as its status as a pole underlying the temporal flowing of the manifold of consciousness places its unity as somehow being constituted outside of that flow. Husserl attempts to get around the temporal limits of this static account by providing an account of the temporality of the Ego's mode of givenness as a unity. This account attends specifically to the Ego's mode of appearance as an object immanent to the flow consciousness, wherein its identity as

¹⁸ See Klaus Held's (Held, in Drummond, 2019, 212–213) definitive analysis of the correlation between the Ego as pole and the object pole and the dependence of the former on the latter in Husserl's account of the static constitution of the Ego.

the “subject” of that flow presents itself as a unity not only in that flow’s present moment but also in the moments of that flow that are no longer present and therefore past. As such, the unity of the Ego’s identity must encompass two temporal dimensions, those of the present and the past. The genesis of its unity therefore requires an account of *how* the two different temporal moments that compose its identity are unified.

Husserl’s account of the ‘how’ in question appeals to the *act* of reflection in which the Ego is given as a reflected phenomenon that manifests itself in terms of the radically different dimensions of time that characterize the *how* of its phenomenal manifestation. The reflective act in question is charged by Husserl with the task of synthesizing the Ego’s givenness as a unity *having been* present and therefore as no longer present but past, with its givenness as enduring in the present. Such a synthesis is supposed to take place on the basis of the recognition that both the present and past temporal dimensions of the Ego are essential components of its identity as Ego, such that its unity as the *same* Ego is constituted. The Ego’s unity is therefore constituted as a *unity in temporal difference* or, equivalently, as a *difference in temporal unity*.¹⁹ Husserl’s term for the peculiar temporality of this unity is the “living present.”

12 Problems with Husserl’s Genetic Account of the Ego’s Temporal Identity

There are two interrelated and fundamental problems with this genetic account of the Ego’s temporal identity. The first concerns the phenomenological status of its unity. The second concerns that of the phenomenological origin of the manifold its unity putatively unifies.

Regarding the account of the constitution of the Ego’s unity as an identity that encompasses its past and present temporality, it is evident that Husserl’s account of the form of this unity does not originate in the manifold that composes that temporality. But rather, it is imposed on it from without, by an act of reflection that does not belong to that manifold. The resulting ‘unity’ of the Ego, as the putative *living present* wherein the past and present phases of the Ego are supposed to be united in the genesis of the Ego’s identity despite the difference between these temporal phases, therefore has its basis in the unity of another temporal manifold: namely, the act that generates the reflection on these phases. The genesis of the unity of this second manifold cannot be accounted for by the unity of the Ego’s identity since it is supposed to be responsible for that unity. It is therefore apparent that this account

¹⁹For a particularly nuanced account of the lack of priority of ‘unity’ and ‘difference’ in the temporality of the Ego at issue here, see (Mickunas, 2001, 164–165).

of the genesis of the identity of the Ego, as that which encompasses the living present, does not have its basis in a unity generated from a phenomenological manifold. Instead, it has its basis in a *form-content* schema that is, in effect, a reconstruction of that which it is supposed to provide a *phenomenological* account of: namely, the Ego's unity as an identity constitutively generated by the phenomenological manifold to which it belongs. The 'form' in question is the living present that is supposed to be synthetically generated from the reflective act of recognition that the temporally discrete past and present phases of the Ego's temporality belong to the same Ego. The 'content' in question is the temporally determinate manifold composed of the discrete temporal phases whose unity *as* temporal the form of the living present is supposed to unify.

Regarding this content, that is, the manifold phases of temporality that the reflective act is supposed to synthesize into the unity of the living present, a closer look at Husserl's account of its genesis will disclose that this account, too, has its basis in the form-content schema. As such, this account reconstructs rather than evidentially discloses the *descriptive* essence of the flowing stream of consciousness that composes a phenomenological manifold. Moreover, Husserl's account of this content itself, on closer inspection, will be disclosed as having its basis in the conceptuality of exact mathematical essences. As mentioned, Husserl's account of the subjective phenomenon of time articulates it in terms of the essential correlation between the phases of time consciousness and those of temporality. Hence, essentially correlated to the temporal phase of the past is the consciousness of the past consciousness—retention—while to the temporal phase of the future is correlated the consciousness of the future—protention—and to the temporal phase of the present is correlated the consciousness of the originary now—primal impression. These three phases of time and the consciousness of them are meant both to capture the essence of three of the four phenomenal dimensions of the unitary phenomenon of time and to prepare the way for capturing the essence of time's fourth dimension, that of its succession.

Husserl's account of succession employs the descriptive terms "flowing" or "streaming" to characterize the morphologically eidetic singular *movement* of time consciousness. Husserl traces this movement in terms of an account of the relation of retentions and protentions to the originary now. Retentional consciousness is described as the awareness of the past that at once is a succession of just passed (elapsed) nows *and* an enduring awareness of the passing of the elapsed nows *that takes place in* the primal impression of the originary now. Protentional consciousness is described as the awareness of the future that is at once the arrival into the originary now of a succession of anticipated nows and the enduring awareness of their anticipation in the original now's primal impression.

13 Three Salient Aspects of Husserl's Account of the Essence of Temporal Succession

Three things stand out in this account of the essence of the successive movement characteristic of the phenomenon of time. One, although it characterizes the essence of a succession, the essence in itself is not successive. That is, both the elapsing and arriving nows are characterized in terms of their relation to the original now's impressional awareness, which, unlike the nows that elapse and arrive, is characterized as unmoving. It is so characterized, since as the reference point for *elapsing* and *arriving* units of meaning, it itself does not move. Two, despite its non-motion, the primal impression is nevertheless the origin of the movement of time by virtue of its status as the *source* of the multitude of nows that compose the temporal manifold of consciousness. This is the case because Husserl's descriptive account of that manifold maintains that each just passed elapsing now retains a relation to the impressional now, which, among other things, can only be possible if each elapsing now is replenished by a *fresh* now that is fully present just insofar as it hasn't elapsed yet. And three, nowhere so far in this account of the content of the manifold of the phases of temporality and the consciousness of those phases has the eidetic singularity of the peculiar differentia of the units of meaning that compose these temporal and conscious phases been accounted for. Insofar as the differentia in question here concern the constitution of each of the phases *and* the consciousness of them as an instance of something that is multiple, this is to say that Husserl's account of the temporal manifold of consciousness discussed so far does *not* address the phenomenological conditions of the possibility of its givenness precisely as a phenomenological *manifold*.

14 Husserl's Account of the Constitution of Time Consciousness Does *Not* Reflect His Late Criticism of the Immediacy of the Givenness of Impressions

Husserl's early investigations of inner time consciousness account for the differentia in question on the basis of a characterization of the material (*sachlich*) content of the primal impression, namely its phenomenal status as a *sensation*. In contrast with the characterization of sensation in empirical theories of perception, namely, as unified bundles, Husserl initially maintained that the *phenomenon* of sensation appears as a "datum." As such, its "apprehension makes us conscious of something objective as given, 'in person', which is then said to be objectively perceived" (Husserl, 1991, 7). Sensory or "hyletic data" composed half of Husserl's initial account of the most fundamental and primitive distinction in the composition of a phenomenological manifold, the other half being "intentional form." While Husserl's mature investigations in the *Crisis* rejected the fundamentality of this hylomorphic schema and with that, of hyletic data as being "immediately given"

(Husserl, 1970b, 125), he nevertheless did not abandon the crucial role of the *primal impression* in his late manuscripts' account of time. Indeed, the primal impression remained absolutely essential in Husserl's account of the source of the most basic units of the meanings proper to the temporality of the phenomenological manifold. Specifically, it is essential to his account of the original now given in it as something *punctual*, namely, as a "now point."

Husserl's account of the now as a *point*, as an *ideal limit*, as something *abstract*, as a *form*, gives rise to two crucial questions. On the one hand, in what sense, if any, are these terms descriptive, in the precise sense of the criteria Husserl presented in *Ideas I* for distinguishing essences that are phenomenological from those that are mathematical? On the other hand, what methodological perspective is responsible for discerning this as well as the other essential characteristics of the flowing manifold of time consciousness?

Mindful of Husserl's criteria for distinguishing mathematical, which is to say, *exact* essences from phenomenological, i.e., *morphological* essences, the first question can be reformulated as follows: is it possible to understand the terms in question—point, ideal limit, abstract, form—morphologically? On the surface, the obvious answer would seem to be "no." 'Point' and 'ideal limit' signify something *exact*. And while 'form' and 'abstract' need not signify something exact, nevertheless, if the form and abstraction in question referred to a point and ideal limit, both would appear to mean something that is exact. But these terms are meant to describe *not* this or that *individual* phenomenological manifold but the *essence* of any arbitrarily given manifold, and therefore, to describe the essence in the sense of an *eidetic singular*. So, the question may be refined, such that what is under interrogation is whether the phenomenologically peculiar ideal status of the essence *itself* that is characteristic of the flowing dimension of the phenomenological manifold is appropriately characterized—in reference to the *phenomenon* of flowing—by terms that have exact conceptual meanings, even though that which instantiates this essence is something that is *inexact*. Point and ideal limit, then, would characterize *that which makes possible* the appearance of something like a flowing that, in its concreteness, is neither punctual nor limited in the exact sense.

The answer to this refined version of the question is no doubt connected with the answer to the question regarding the methodological perspective from which the basic units of the temporal phases of time are differentiated and time consciousness' relationship to them discerned. In general, of course, the perspective in question is governed by the methodological protocol of the *epoché*. More particularly, the reflection in question is directed to the mode of givenness of the phenomenon of time, which is to say, its appearance. As mentioned already, Husserl's account of its appearance tracks the static and genetic phases of the development of his thought, and for both the crucial aspect characteristic of the appearance in question is the primal impression. Husserl's methodical access to the phenomenon of time clearly presupposes the attempt to *grasp* the primal impression, whether in terms of its static correlation with the appearance of the object or its pre-objective and passive genesis. Crucial to either methodical approach is the resolution into a unity of that

component of the primal impression that is designated as ‘flowing’, together with an account of the origin of the movement associated with that flowing.

15 Ambiguity in Husserl’s Account of the Origin of the ‘Now’

Leaving aside for the moment the implications of Husserl’s own late recognition that impressions are *not* immediately given for his account of the origin of the movement in question, his account of the relation of the primal impression to the now can be seen to be problematic on its own terms. On the one hand, new impressions or sensations are characterized by him as already informed by the now, in which case the now is not presented as the content of the impression but as its form. “[T]he primordial temporal form of sensation, or, as I can also put it, the temporal form of primordial sensation, here of the sensation belonging to the current now-point and only to this ... must, in strictness, be defined through primordial sensation, so that the proposition asserted has to be taken only as an indication of what is supposed to be meant” (Husserl, 1991, 69). On the other hand, the primal impression is characterized by Husserl as the phase of time consciousness that “has as its content that which the word ‘now’ signifies... Each new now is the content of a new primal impression” (Husserl, 1991, 70).

What is problematic here is not so much the “circular definition” (Bernet, 1982, 103)—or, better, fallacy of equivocation evident in the account of the relation between the primal impression and the now but the methodological presuppositions responsible for the ambiguity behind it. That is, the logical problem implicit in the characterization of the ‘now’ as both the form of the primal impression, and thus as a structure inseparable from its appearance, as well as its content, and thus as something that appears to and therefore is *other than* the primal impression’s appearance, is derivative. As such, it has its source in the methodical attempt to grasp the eidetic singular of temporal flowing according to a form-content schema. Once this schema is projected onto the phenomenological manifold composed by time consciousness, the *inexact* essence of its flowing is divided *exactly* in two. A symptom if not a sign of this is Husserl’s characterization of the ‘now’ as belonging both to the form of the impression and to its content.

The methodological inappropriateness of Husserl’s employment of exact terms to characterize the inexact essence of the phenomenon of flowing determinative of time consciousness is compounded by his use of the concept of a *continuum* to characterize the essence of the temporal flow proper. The units of the continuum are characterized as a manifold of nows, each one of which has a temporal position relative to the primordial now point in which it originates and to which its temporal position remains related as it shifts with each *fresh* now. The continuum is composed of two dimensions, the past and future, from which the single dimensional flowing of time consciousness is constituted. The key to Husserl’s account of the

manifold of nows as continua of past nows and nows to come (future) is the "law of modification" (Husserl, 1991, 31, 339) that governs the generation of their temporal position. The now point, as an ideal limit, manifests the *form* of the ever-new nows generated by the primordial impression. The law of modification governs the movement of these nows in the temporal dimensions of the past and future. The former dimension is constituted by the modification of the primordial impression called *retention* and the latter by the modification of it called *protention*. In retention the primordial impression's now is initially divided into the originary now and the just past now, which as *just* past remains a part of the primordial impression. Husserl terms this initial retention *primary memory*.

Retention is also responsible for the modification of the just past now into the just-just past now, and again, the just-just-just, past now, and so on, such that a continuum of retended nows is composed that recedes from the originary nows associated with the primordial impression. The law of modification also governs each retention's retention of all the just, just past nows, and so on, divided from the impressional now "preceding," as it were, its division from the now point limit connected with the primordial impression. Thus, on Husserl's account, the law of modification governs the generation of the phenomenon of the past as a series of just past nows, each one of which is itself a retentionally generated continuum containing retentions of all the just past nows up to the primordial now from which it was originally divided. This continuum of retended nows forms the retentional horizon of the originary nows wherein is constituted primary memory. Husserl contrasts the unmediated relation of primary memory to its origin in primary impression with the mediated relation to the originary nows of secondary memory, which he designates as "recollection." On Husserl's account, the retentional horizon exhibits the capacity to be awakened, such that that which was originally presented in the primal impression is recalled as an identity that transcends the unmediated flow of primary impressions ceaselessly slipping away in the continuum of retentions. The making present (*Vergegenwärtigen*) of the identity in question constitutes the transcendence of the thing in the living present as something that is identical, and therefore as something that stands in *objective* contrast to the *subjective* manifold of the unmediated pre-objective passive flow of the continuum of impressions and retentions in which it originally presented itself.

Three things stand out in Husserl's account of the essence of the phenomenological manifold of time consciousness, that is, his description of the eidetic singular that articulates the phenomenological condition of possibility of this manifold's flowing movement. (1) The ambiguity of the now, which is manifest in its characterization by Husserl as both the form and content of the primordial impression, makes it impossible to discern *eidetically* the origin of the phenomenological manifold in which time consciousness is constituted. This is the case, above all, because the origin of the form and content of this manifold is attributed to the same structural phenomenon, i.e., the now. Thus, in the cases of both the finite and absolute manifolds at issue here, it is impossible to discern on the basis of Husserl's account whether the source of the multiplicity of nows that constitutes them is *formal* or *material* (*sachlich*). (2) Either way, the division of the unity of the present now into

the continua of just past nows and nows to come, each one of which—just past or to come—according to the law of modification, presupposes rather than accounts for the *phenomenal* basis of the cuts in question. That is, rather than appeal to the *how* in their appearance the temporal shifts come about that constitute the flowing stream of just past nows and nows to come, the (exact) *concept* of continuum invoked by the law of modification is supposed to account for the phenomenological conditional of possibility of these shifts.²⁰ (3) The priority of *memory* in the making present of the transcendent object, brings to the fore the question of the relation of the phenomenon of *forgetting* to both memory and to the *emergence* of that which appears as present in the living present.

16 Husserl's Methodological Presuppositions Block a Phenomenological Account of the Unity and Multiplicity of a Phenomenological Manifold

For our purposes, Husserl's use of an exact *mathematical* concept to characterize the eidetic singular putatively responsible for the flowing of the temporal manifold will be the focus of the discussion of these points. The difficulty if not the impossibility of accounting for the phenomenon of forgetting once the concept of continuum is invoked in connection with the law of modification is evident in the answer to the following question: Does the *law* of modification in the case of retentive consciousness admit exceptions? If not, the original now in which the continuum of any finite phenomenological manifold is generated should *always* be capable of being remembered. Husserl, in fact, admits as much: "*idealiter* a consciousness is probably even possible in which everything remains preserved retentionally" (Husserl, 1991, 32). This account of memory is thus challenged to account for the fundamental *discontinuity* of the *phenomena* of both the past and that which is forgotten from present consciousness. Moreover, one searches in vain in Husserl's manuscripts on time consciousness for an account of forgetting.

Likewise, in the case of the protentional scope of the law of modification, there is the related difficulty of accounting for the phenomenon of the emergence of something to come that is unanticipated and therefore *discontinuous* with what is

²⁰Thus my claim here is *not* that Husserl employs the mathematical concept of a continuum to *model* the non-exact essence of the phenomenal (intuitive) "continuum" of the manifold stream of time consciousness, but rather: that his very account of the phenomenological genesis of the streaming of time illegitimately employs exact concepts, in this case, that of a continuum, in its descriptive account of the phenomenological essence of the genesis proper to time consciousness' eidetically singular streaming. On my view, then, the issue here isn't the putative priority of an intuitive continuum over a mathematical continuum, an issue that implicitly posits or otherwise presupposes their opposition. On the contrary, the issue as I see it is that of the legitimacy of characterizing the phenomenological essence of the manifold of time consciousness as a *continuum* at all. See (Tarditi, 2018, especially, 144) for an account of the view I am opposing here.

unexpected. Given Husserl's account of the symmetry between protentional and retentive modifications, as well as the role of the latter in the structure of the former, the answer to the following question is crucial: whether exceptions to the *lawful* foundational role of retentions in the constitution of protentions are possible. Or, in other words, can the lawful modification that generates protentions account for the phenomenal emergence of something that is *completely* unanticipated? Given the tight connection in Husserl's account between retention and protention, wherein the continuum of retentions adumbrates the horizon of the continuum of protentions, the answer to this question would seem to be no.²¹

Husserl's appeal to exact mathematical concepts to characterize the eidetic singular of the flowing unity of the manifold of time consciousness has been shown to be inadequate to the task of accounting for the essential inexactness of both the unity and multiplicity of the phenomenon in question. The phenomena of unity and multiplicity, however, remain, and indeed, they remain in need of a phenomenological account of their essential conditions of possibility. At issue, then, is an account of the constitution of the unity and multiplicity of the phenomenological manifold uncovered by Husserl's transcendental phenomenology, which, as we have seen, involves the appearance of two manifolds: (1) that of the living present and (2) that of the (finite) streams of lived-experience that come and go in the living present. Accounts of both are therefore tasks for the future, the horizon of which will be sketched in the remainder of this discussion.

17 Historicity of the Unity and Multiplicity Constitutive of Phenomenological and Mathematical Manifolds

Husserl's last work, *Crisis* (Husserl, 1970b), introduced historical meditations on both the essences of the meanings operative in the exact sciences and the most immediate experience of the world. In both cases, manifolds are involved, and therefore the constitution of both the unity and multiplicity out of which they are composed. Because of the fragmentary nature of these meditations, however, they only offer hints about how to advance the problematic. In order to advance beyond those hints, the historical horizon of the meaning inseparable from the unity and multiplicity of manifolds adumbrated in Husserl's last work will be delineated.

There are three manifolds in play here: (1) that composing the living present, (2) that composing the finite streams of lived-experience that come and go in the living present, and (3) that composing the domain of mathematics. As we have seen above, Husserl's account of both the unity and multiplicity composing each of these

²¹ Husserl's sole discussion of surprise in his analyses of time consciousness (Husserl, 1991, 144) does so in terms of an unfulfilled expectation, in which the unexpected now to come doesn't come. This account, however, does not address the condition of possibility for the appearance of a pretended continuum of nows that arrives in the primal impression that is neither expected *nor* anticipated.

manifolds cannot withstand phenomenological self-critique. In the first two manifolds mentioned here, that is because both the unity and multiplicity of each are accounted for on the basis of illegitimate appeals to mathematical (exact) concepts. In the last-mentioned manifold, it is because both unity and multiplicity are accounted for on the basis of a logical unity that is not phenomenologically established and, moreover, rejected by the development of the science of logic in the first half of the twentieth century.

In the version of the text “*Die Frage nach dem Ursprung der Geometrie als intentional-historisches Problem*” published by Eugen Fink (Husserl, 1939), a connection between “sedimentation” and forgetting is made. “Sedimentation is always somehow forgetfulness” (Husserl, 1939, 212).²² This connection provides a crucial hint for future research on phenomenological manifolds, as it points in the direction of the phenomenological fundamentality of *forgetfulness* over memory in the constitution of the past. In connecting the passive diminishment of the original meaning of words and concepts constitutive of the phenomenon of sedimentation with the phenomenon of forgetfulness, Husserl seems to recognize the phenomenological priority of *discontinuity* in the constitution of the horizon of the past in relation to the consciousness of the present.

Sedimentation is inseparable from the traditional transmission of knowledge. The phenomenon of tradition, on Husserl’s view, manifests the intentional-historical dimension of the past that constitutes an essential horizon of the living present. In Husserl’s fragmentary analyses in the *Crisis*, the multiplicity of present-day philosophies is symptomatic of the lack of unity crucial to the essence of philosophy. It is precisely this lack of unity that motivates Husserl’s historical reflection back to the original intentional-historical processes constitutive of the foundational meanings of the exact, natural, and philosophical sciences. Husserl’s term for the goal of this reflection, “reactivation,” however, indicates that he is still under the spell of his account of the primacy of memory in the constitution of the past that is evident in his account of internal time consciousness.

Hence, a first task for future phenomenological research is the investigation of the role of the phenomenon of forgetfulness in the constitution of both internal and historical time consciousness.

Related to this first task is the second of reassessing Husserl’s account of ‘recollection’ in the making present of the transcendent object in the living present. This is the case, because once the discontinuity between the horizon of the past in relation to the present is recognized, the phenomenological account of the horizon of the past being directly accessible to acts of recollection, such that the latter exhibit the unmediated capacity to “awaken” primary memories, becomes problematic. It does so, because recognition of the essential discontinuity between the phenomena of the present and past presents evidence that challenges any phenomenological account that presupposes, without further ado, the direct access of present acts to the

²²This sentence is left out of Biemel’s Husserliana (Husserl, 1976) version of the text, translated by Carr (Husserl, 1970b).

past appearances to consciousness of both objects and their modes of presentation. In connection with this evidence, the investigation of the phenomenological appropriateness of the descriptor 'recollection' for a phenomenon—namely, recollection—in which there is no *forgetfulness* in play, is another task for future phenomenological research.

The third phenomenological task involves the investigation of the constitution of both the multiplicity and unity of the immediately given manifolds that begin and end. Absent the immediacy of impressions in their givenness, and absent, too, the priority of memory in the constitution of their flow, the investigation of the role of the phenomena of sedimentation, forgetfulness, and recollection in their constitution in the living present is called for.

A fourth and final phenomenological task involves the investigation of the constitution of the logic proper to the symbolic mathematics that determines “what in fact, and in a way practically understandable in mathematical work, a coherent mathematical field is” (Husserl, 1970b, 45). This task is called for, because Husserl still holds that the answer to this question is to be found in his notion of “theory of manifolds” (ibid., 46) as “the universal science of the *definite* manifolds” (ibid.). That is, Husserl's answer to this question in his last work is the same as that in his first phenomenological works, as his footnote in (ibid., 46) makes clear, by referring the reader of the *Crisis* to “a more exact exposition of the concept of the definite manifold” (ibid.) in *Ideas I* and the *Logical Investigations*. Inseparable from this task is an account of the intentional-historical meaning that is sedimented in the origins and development of the “universal ‘formalization’” (ibid., 45) that is the *sine qua non* for contemporary mathematics and therefore, of foundational importance for the intelligibility of its meaning. Such an account would have to be attentive to the distinction between idealized and formalized mathematical meanings mentioned above. In connection with this investigation, the possibility of complete *reactivation* of these origins in light of the role of forgetfulness in the constitution of the phenomenon of sedimentation will also have to be critically explored.

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