

From Existential Spatiality to the Metric Science of Space ...

(از مکان‌مندی وجودی تا علم متریک مکان؛ تلاشی به‌منظور بازسازی وجهی از تحلیل وجودی)

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has limitations and contents; it is mapped by objects (which have an inside and an outside), distances, directions, roads, and boundaries.” This description provides something like a “topology of anisotropic space”. By scrutinizing it, one can define norms (of spatial orientations) and varieties of (pathological) deviations from these norms. This is a job of the psychiatric existential analysis. However, a topology of anisotropic space provides us also with the pre-scientific image of space as an object of knowledge. This is why it is quite relevant to the task of reconstructing the existential genesis of the mathematically codified concepts of space.

8. What I have in mind is Husserl’s manuscript “The Origin of Geometry” written in 1936, and published in a reduced version for the first time by Eugen Fink in 1939. The text is included as “Beilage III” in Biemel’s edition of the *Crisis*.

9. See on this criticism Ginev (2006, pp. 50-75) and Ginev (2008, pp. 95-109)

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have designated as the inconspicuousness of the proximally ready-to-hand.” Generally speaking, the relativity effects are due to the discordance between contextualizing a utensil for reaching a purpose and grasping the outcome of that contextualization as an actualized possibility.

5. By privileging lived body as an absolute point of spatializing, Merleau-Ponty eliminates in *Phenomenology of Perception* the need of distinguishing between spatiality of readiness-to-hand and spatiality of being-in-the-world. Since the bodily experience unites man’s transcendence of the things within-the-world and the modes of spatializing and constructing images of space, there is only one source of spatializing. Accordingly, the primary spatiality (the “lived space” of man’s directedness to things) gets specified in connection with the typical grasp on man’s body in various “anthropological spaces”.

6. In *Being and Time*, the notion of a “relatively closed environment” occupies an intermediate status between the notions of spatiality and space. A relatively closed environment is the directionality of the de-severance in articulating contexts of equipment within-the-world. It is a particular “whither” of encountering “things” that ready-to-hand. Thus considered, a relatively closed environment is the spatial unit of the worldhood of the world.

7. Starting point of the psychiatric studies in spatiality is the account of the “oriented space”. At stake is the issue of the constitution of anisotropic spaces as related to the feeling that particular directionalities have specific values. One cannot visualize oriented space as an empty continuum. The body is regarded as a center of reference that informs the anisotropic space of a characteristic state-of-mind. Binswanger (1955, pp. 74-97) makes the case that the vertical axis is the basic axis of human existence. The order of what is ready-to-hand within-the-world is felt as a constant movement upward or downward. The linguistic expressivity of privileging the vertical axis is also a subject of prime importance in phenomenological psychiatry. Here is a typical statement raised by Henry Ellenberger (1958, p. 109) that deserves to be quoted: “In contrast to the isotropism of mathematical space, oriented space is anisotropic, i.e., each dimension has different, specific values. There is a vertical axis, with its up and down. There is a wide, horizontal plane, in which before and *behind*, right and left are differentiated. Two lines of the same length have a very different value if they are in our ‘near space’ or ‘remote space’, if they are between two objects or between us and an object. In oriented space, ‘great’ and ‘small’ are not relative measures but well-defined, qualitatively different sizes. We cannot visualize oriented space as an empty continuum; it

not cease to be embedded in a horizon of open possibilities projected by changing configurations of practices. The interpretative openness of conceptualizing space has always priority over defining its formal invariance. There is no mathematical space whose genesis is released from a characteristic hermeneutic situation.

Endnotes

1. Roughly speaking, Klein's celebrated program is an attempt at characterizing geometries on the basis of projective transformations and group theory. On the basic assumption of this program, the more one is progressively restricting the range of transformations, the greater is the enrichment with regard to specific spatial objects. In another formulation, the less of the properties remain invariant under the respective group, the greater is the number of particular geometrical objects.

2. In Section 24, Heidegger refers to Becker's work. On Husserl's praising of Becker's phenomenological investigations of geometry, see: Husserl, 1994, p. 293.

3. Since geometrical spaces are founded upon life-world's experience and concomitant "anthropological spaces", Merleau-Ponty envisages a kind of hierarchy: embodied lived space that expresses man's intentionality toward the world – original (anthropological) spaces expressing the spatiality of various human states (normal everydayness, magical experience, dreaming, childhood, psychopathological states, etc.) – mathematically codified spaces (in particular, isotropic geometrical space). The deepest stratum is produced by what he calls "anonymous intentionality". In order to reach this stratum Merleau-Ponty appeals to a special reduction that would enable one to remove all layers of meaning regarding space imposed by common-sense experience and diverse forms of theorizing. This is a reduction that has to invert the aforementioned hierarchy. The final point of it is the originally embodied experiences out of which the "spatiality toward the world" arises.

4. Remoteness and closeness are qualitative features of Dasein's circumspective thrownness in everyday practices. To this thrownness belong the relativity effects of spatiality. In this regard, Heidegger (1962, p. 141) provides the following illustration: "When a man wears a pair of spectacles which are so close to him distantly that they are 'sitting on his nose', they are environmentally more remote from him than the picture on the opposite wall. Such equipment has so little closeness that often it is proximally quite impossible to find. Equipment for seeing – and likewise for hearing, such as the telephone receiver – has what we

closed environments. This tendency leads to envisaging space as a “homogeneous substance” (something like Cartesian *extensio*) that permits continuous deformations.

Now, with regard to the ambiguity of the hermeneutic situation the question of which geometrical space has a priority in the existential genesis of spatial idealizations arises. On the one hand, this should be the space of homeomorphic objects whose properties remain invariant under topological transformations. As I noted, this is the geometrical space that preserves to a greatest extent the idea of place and locality as this idea is inherent in (pre-scientific) circumspective manipulation. This is why Heidegger ascribes to the homogeneous (topological) space a status closest to the characteristics of existential spatiality. On the other hand, however, circumspective manipulation is often engaged with particular spatial objects that exhibit features of the metric geometry’s objects. The tendency that explicates the hermeneutic situation of geometrical idealizations’ existential genesis is rather leading to measurable objects in dimensional space, i.e. to the objects of metric space. In the spaces brought into being by geometries with less restricted transformations, all of these objects that supposedly are ready-to-hand in circumspective manipulation involving practices of measurement cease (progressively) to be meaningful objects.

In the framework of Heidegger’s existential analytic, one is unable to decide which geometrical space (that with most restricted group of transformations, or that which allows the existence of localities and places but excludes metrics) has a priority in the existential genesis of spatial idealizations. The reason for this shortcoming is Heidegger’s strong dichotomy between “circumspective deliberation” and objectifying idealization based upon mathematical’ projection. He isolates this projection from any configuration of practices, making it thereby something that is opposed to all practices within-the-world.⁹ In fact, mathematical projection is only a particular scientific practice that is always entangled with several other theoretical and non-theoretical practices. It is the texture of these practices that gives rise to mathematical (in particular, geometrical) spaces. Scientific research has its own “circumspective deliberation” embedded in the interrelatedness of its practices. Accordingly, there are various kinds of spatializing that generate a plurality of possibilities for constituting mathematical spaces. The “existential genesis” of the latter is scattered on several hermeneutic situations according to particular configurations of research practices and possibilities they project and appropriate. The conceptualization of space by means of a mathematical projection does

Put differently, there is a “tendency” in the spatializing of circumspective manipulation for generating a dimensional space. The constitution of meaning within routine everydayness’ practices is oriented as it were towards actualizing possibilities of transforming spatiality into dimensional space. It is the tendency for removing privileged directionalities of heterogeneous environments in favor of spatial dimensions that enables one to reflect upon the hermeneutic situation of the existential genesis of idealizations about geometrical and other mathematical spaces. At a certain moment, this tendency results in the projection of formal structures that define space’s geometrical invariants.

Granted that spatial dimensionality is a prerequisite for measuring spatial relations, the tendency in question is to be associated in the first place with practices that demand the introduction of quantifiable distances. More specifically, the unity of fore-sight, fore-having, and fore-conception that licenses the formation of idealized space-concepts is embedded above all in practices of (pre-scientific) measurements. In such practices, one operates tacitly with distance, and not with closeness and remoteness. The situation of generating spatial dimensionality is that of changing the ongoing making room within contexts of equipment in making present a dimensional space of measurable distances. Yet in replacing closeness and remoteness of circumspective manipulation with distance as the most elementary entity that remain invariant under the transformations of metric group, one opens the door to a next step – the commitment to a highly strong idealization of metrics. The space in which the axioms of metrics are satisfied is much stronger in its formal codification than the spaces of projective and affine geometry (and even than the space of Euclidean geometry where distance is not an invariant property and assertions about precise measurements do not appear as theorems in its axiomatic system). This is why in Klein’s hierarchy metrical geometry is that one with the most restricted group of transformations. However, this is the geometry that gives rise to the most particular geometrical objects. Just because it is with the most restricted range of transformations, it is the richest geometry with regard to the possible objects it allows to be constructed.

Against the background of these considerations, one may establish an ambiguity in the hermeneutic situation of formal space’s genesis out of the circumspective manipulation’s spatializing. On the one hand, there is a tendency to conceptualizing space by introducing dimensionality and metrics. On the other hand, the interrelatedness of practices that discloses environments within-the-world gives rise to a tendency for perceiving and conceiving of space as a “volume” that embraces and keeps all relatively

situation that ought to be elucidated in terms of the constitutional analysis of meaning being employed so far. On Heidegger's account, each kind of theoretical attitude that engenders de-worlding and delimitation of a research domain of thematic objects is predicated on a hermeneutic situation. The latter manifests itself as a "tendency" to constituting such a domain. It is a tendency characterized by the triad of fore-having, fore-sight, and fore-conception (anticipation of, expectation of, and orientation towards objects of a given type). The hermeneutic situation occurs on the terrain of trans-subjective practices and projected possibilities. It is a situation within interrelatedness of practices. Furthermore, there is a hermeneutic situation of delineating a domain of thematic objects because the transcendence of the world can be transformed into a structure of objectification. With regard to the present problematic, there is in articulating contexts and environments a tendency to promote such images of space in which directionalities are replaced with spatial dimensions. Thus, dimensionality is a feature manifested already in images of space embedded in circumspective manipulation. Heidegger has good reasons for making the case that the genesis of dimensionality is rooted in practices of measurement. According to him, practices of observational measurement anticipate the concept of dimensional space. By means of these practices, "wheres" discovered interpretatively by everyday circumspection get "standardized" in a manner that allows one to "unveil dimensionality".

In trying to specify this view, let me repeat from a slightly different perspective some claims already discussed. The projection of possibilities (for circumspective manipulation) by configurations of practices is a trans-subjective event. In appropriating and actualizing possibilities, Dasein constitutes both its individual subjectivity and its being-with-one-another (inter-subjectivity). Since the appropriation of possibilities is an interpretative process, the constitution of subjectivity and inter-subjectivity takes always already place in a trans-subjective horizon of interpretation. In projecting possibilities, each configuration opens up a relatively autonomous environment of interwoven contexts of equipment. The interpretative constitution of meaning through actualizing possibilities is an ongoing spatializing. The transition from existential spatiality (and the concomitant images of anisotropic and dimensionless space) to a homogeneous (proto-mathematical) space comes also into being as a result of actualizing certain possibilities – those of transforming privileged directionalities into spatial dimensions. In the circumspective manipulation of routine everydayness there is a constant anticipation of that making-room which constitutes dimensional space.

for Heidegger, the possibility of objectifying idealizations of space is due to an intrinsic transformation of the trans-subjectivity of interrelated practices. By means of this transformation the world ceases to be an open horizon, and becomes a static space that “contains” all things as a presence-at-hand.

To sum up, Heidegger is stressing the trans-subjectivity of meaning related both to the everyday mode of being-in-the-world and to the construction of geometrical idealizations, whereas Husserl lays emphasis upon the inter-subjectivity of passivity. For Husserl, the life-world’s inter-subjectivity gets replaced by the inter-subjectivity of the geometrical tradition’s passivity. As I pointed out, such a claim is completely unacceptable for Heidegger, who treats (all kinds of) inter-subjectivity not as ontologically primordial phenomenon, but as something ontically arranged. Inter-subjectivity becomes possible because of the transcendence of the world-horizon. The difference between Heidegger’s approach to the existential genesis of space and Husserl’s approach to the origin of geometry is essential since it concerns the paradigms of constitutional analysis, and the issue of how to guarantee the independence of this analysis from epistemology.

Husserl treats inter-subjectivity as a step-by-step extension of subjectivity that constitutes meaning. Accordingly, the life-world’s inter-subjective mentality is conceived of as the place of constituting the pre-scientific meaning of spatial relations that are taken for granted in producing all geometrical idealizations. Yet the talk of an inter-subjective mentality is at the same time a discourse with significant epistemological implications. In conceding that there is an initial inter-subjective meaning that lays the foundations of all scientific constructions, one entangles this meaning in the implicit knowledge by means of which the inter-subjective mentality operates. This is why (despite Husserl’s efforts) there is no clear demarcation between phenomenological constitution and epistemological construction in his approach. By contrast, Heidegger’s elaborations on the existential genesis of (what he calls) “objectifying thematization” allows one to establish the point at which the constitution of meaning within-the-world gets transformed into production of knowledge based upon idealization. This is the point of “de-worlding” (*Entweltlichung*) – the point of “replacing” the world-horizon that transcends each particular context of meaning constitution with mathematical structures that objectify, changing thereby places and localities of the spatiality of readiness-to-hand in purely mathematical positions.

The existential genesis of geometrical space has its own hermeneutic

unfolding the “primal materials of the first formation of meaning” concerning spatial relations. At this point Husserl begins to invest more efforts to distinguish clearly between epistemological and genetic origin of geometry. Phenomenology is only preoccupied with genetic origin. Its task is the disclosure of a sedimentation process of meaning within the geometrical tradition. The final outcome of this disclosure is the explication of the “historical *a priori*” of doing geometry (in particular, constructing formal concepts of space). This is the concrete *a priori* that encompasses the totality of meaning in the development of the geometrical tradition. The history of constructing geometrical spaces must be traced back to the hidden dimension of the pre-scientific self-evidences which underlie the passivity of working in the geometrical tradition. Husserl (1970, p. 378) draws the conclusion that by going beyond the formal constructions of geometry, one can make “thematic that apodictic aspect of the pre-scientific world that the original founder of geometry had at his disposal, that which must have served as the material for his idealizations.” Moreover, this is “the material” that is presupposed in all subsequent work creating ideal geometrical objects. It is the pre-scientific material that makes possible the identical intersubjective meaning within the geometrical tradition.

Now, I am in a position to pinpoint an essential difference between both approaches to a genetic phenomenology of idealized geometrical objects. Heidegger’s scenario of the existential genesis of formalized space follows the formula that under certain conditions the ongoing making room in the contexts of equipment does lead to making space present as something that can be objectified thematically. On the main claim of Section 70 of *Being and Time*, the (inauthentic) “forgetting which awaits” hypostatizes the present. Yet spatializing in the routine everydayness is founded in the present. In other words, the ongoing spatializing within-the-world contains in itself the possibility of transforming localities of spatial relations between things that are ready-to-hand into relations that can get de-contextualized and be made present-at-hand. Heidegger (1962, p. 421) states: “When we make something present by bringing it close from its ‘thence’, the making-present forgets the ‘yonder’ and loses itself in itself. Thus it comes about that if ‘observation’ of entities within-the-world commences in such a making-present, the illusion arises that ‘at first’ only a Thing is present-at-hand, here of course, but indefinitely – in a space in general.” This quotation supervenes on Heidegger’s account of Dasein’s “breaking into space” on the basis of everydayness’ ecstatic temporality. If one formalizes the spatial relations that are made present, a formal concept of space will arise where contextual localities would not have a meaning anymore. Thus,

this original creative activity that gets sedimented by all subsequent theoretical acquisitions within the tradition of (explicit) geometrical knowledge.

Following this line, the genesis of the formalized concepts of space lies in the original constitution of the “total meaning of geometry” that can be revealed by a regressive study of the geometrical tradition. Husserl equates this (presupposed) total meaning with the constant implicit knowledge assigned to those who are working within the geometrical tradition. Since the tradition with its historical dynamics articulates in deductive theories the total meaning of geometry, the existence of geometrical objects (including space) is not to be attributed to the personal sphere of consciousness. The status of these objects depends entirely on the epistemological criteria of existence established in accordance with tradition’s implicit knowledge. In other words, geometrical existence is determined by that inter-subjectivity which is constituted by all persons who share tradition’s implicit knowledge. This is why Husserl goes on to argue that the ideal objectivity of geometrical spaces presupposes always already a primary inter-subjectivity that is independent of historical styles of thinking, peculiarities of national cultures, or contextual applications of geometrical knowledge in particular social practices.

The next step in Husserl’s scenario of the origin of geometry (and geometrical spaces) is the elaboration on the role of passivity that is inherent in the geometrical sphere of self-evidence. Due to this passivity (i.e. the fact that all meaning arising in the geometrical sphere is put together passively) both the sedimentation and the reactivation of what is self-evident come into being. Passivity is accompanying the whole process in which from initial idealities more and more idealities at higher levels are produced.

As a result, every new ideal construction gains the status of something self-evident. Now, the whole chain of new acquisitions by means of passivity should have a point of departure that supposedly coincides with the point of inflection from what is pre-scientifically given in the cultural world to the original (and logically primitive) geometrical idealities. Husserl (1970, p. 360-362) states that the method of producing such idealities must have been discovered prior to the geometrical conceptualization of space. Accordingly, without pre-scientific (practical) constitution of meaning about spatial relations, geometry would be a tradition empty of meaning. By implication, if one is unable to reactivate the pre-scientific meaningfulness of the original geometrical idealities, one could never decide whether geometry is predicated on a genuine meaning.

On Husserl’s account, searching for the origin of geometry amounts to

in Dasein's primordial mode of being-in-the-world an "essential tendency towards closeness" takes place. The "morphology" of existential spatiality is defined by "circumspective concern" which decides as to the closeness and farness of what is proximally ready-to-hand environmentally.

Directionality is a characteristic of circumspective concern which is de-severing. By means of it, in this concern a "supply of signs" for "whithers" to which something belongs or goes, or gets brought or fetched is coming into being. Making room within a configuration of practices through appropriating and actualizing possibilities is temporalized since it is a directional awaiting of a relatively autonomous environment. Thus, temporalized directionality of dealing with the ready-to-hand is a prerequisite for articulating the world in environments. Finally, out of the temporalized directionality of making room the fixed directions of right and left being already discussed are arising. Like de-severance, directionality of making room is mediating between the spatiality of readiness-to-hand and the spatiality of being-in-the-world. The former contains only contingent and occasional directions of near and remote directions, while the latter is stabilizing and privileging directions like up and down of vertical axis, right and left, before and *behind* of horizontal plane, and so on. The images of "oriented space" are called into life thanks to privileged directions in the constitution of meaning through actualizing possibilities. These are images that help one to identify "great" and "small" as well-defined, qualitatively different sizes.

4. From Anisotropic Spatial Environments To Homogeneous Space

I would like to start this concluding section with a brief comparison of Heidegger's existential approach to spatiality (and the genesis of space) with Husserl's inquiry into the origin of geometry.⁸ To be sure, significant parallels between both undertakings are to be drawn. Husserl is searching for the meaning-origin (i.e. the origin in terms of a constitutional analysis of meaning) of the primitive (in the sense of axiomatic theory) geometrical concepts. It is a search for the most original sense in which these concepts once arose. Husserl's inquiry into the origin of geometry is intended to reveal the primary geometrical idealizations of space as they "appeared in history for the first time". There is a strong epistemological dimension in this inquiry. It consists in transforming an implicit knowledge into knowledge of unassailable self-evidence. Thus, the regressive study of the tradition from which geometry originates should make explicit in particular the first acquisition of the concept of space. It is the knowledge of

whereby the latter become relations of positions in a mathematically expressible manifold.

Let me note again that according to Heidegger, there are concepts of space (both in Dasein's average everydayness and in doing research guided by a theoretical attitude) just because the interpretative appropriation of possibilities within-the-world is constantly making room, uniting thereby the spatiality of circumspective manipulation and the spatiality of being-in-the-world. Heidegger's hermeneutic phenomenology shows the ubiquity of the existentials of making room. There is no scheme of ecstatic temporality without a specific regime of making room (a regime of spatializing that accompanies a certain kind of temporalizing). This is why in *Being and Time* there is a section devoted on "the temporality of the spatiality". Its task is to outline the integrity of "Dasein's spatio-temporal character". More specifically, Heidegger tries in this section to address (though superficially) the problematic of how the modalities of temporalizing get (necessarily) complemented by modalities of spatializing whereby in each "chronotopos" one is making room for one's leeway. In extrapolating issues of this problematic, one might go on to develop a sort of chrono-topology in terms of existential analytic.

In fact, this is an idea already exploited in existential psychiatry. The point here is that each state of temporalizing-spatializing within the world (including the psychopathological states) constitutes a heterogeneity of spatial relations that leads to a peculiar image of an anisotropic space.⁷ The constitution of meaning within routine everydayness accentuates always certain directionalities, loading thereby its outcome – the "oriented and directed meaning" – with specific values. The "axiological structure" of the oriented (and attuned) spaces is precisely what gets lost in the transition to homogeneous space.

The existential spatiality upon which the uncovering of space within-the-world is founded is characterized by the two "parameters" of de-severance (*Ent-fernung*) and directionality (*Ausrichtung*). More specifically, Dasein's making room for its own leeway of actualized possibilities is constituted by directionality and de-severance. The former is not to be confused with the notion of vector that is only definable in a mathematical space. In its "deliberative circumspection" Dasein manages to eliminate the farness of what is ready-to-hand to it. By contextualizing the utensils in the everyday dealing within-the-world, Dasein creates constantly de-severance. In other words, the delineation of a particular context of equipment brings to the fore a kind of de-severance. This is why Heidegger goes on to assert that Dasein is essentially de-severant, i.e. Dasein is making the farness vanish by putting utensils in readiness. Consequently,

a sort of trans-subjectivity that is irreducible to the inter-subjectivity. By contrast, the spatiality of ready-to-hand within-the-world is only a characteristic of being-with-one-another because it is generated by the inter-subjective articulation of relatively closed environments. (I am using the expression of a “relatively closed environment” as a translation of what Heidegger calls *Gegend*.⁶) Thus, the opposition between trans-subjectivity and inter-subjectivity plays an important role in elucidating the difference between both types of spatiality.

In existential analytic, the notion of “making room” is assigned to render possible the dynamic unity of types. Making room (spatializing) within-the-world consists in releasing the ready-to-hand for its possible contexts and relatively closed environments. Making room is constantly accompanying the constitution of meaning as ongoing appropriation of possibilities. Put differently, there is no interpretative articulation without spatializing. Furthermore, one can state that in each context of equipment Dasein is making room for a leeway of possibilities that can be actualized. At the same time, these are possibilities projected as a horizon by the same configuration of practices that discloses a particular environment of interwoven contexts of equipment. As an existentially making room belongs to both the contextual spatiality of manipulating the ready-to-hand and the spatiality that is called into being and established by the transcendence of the world. Only by making room for entities within-the-world, one is able to encounter a totality of spatial involvements of these entities that can be made accessible for cognition. In so doing, one is thematizing space as an object of knowledge *sui generis*.

From the viewpoint of the transcendental position advocated in *Being and Time*, space becomes accessible for cognition and is constituted as a possible object because the contextual making room belongs at once to the circumspective manipulation and to the transcendence of the world, i.e. it belongs at once to the ontic availability of what gets spatialized and to the transcendental condition of having such an availability in the world. All “entities” (including space) that are disclosed in the world by Dasein’s circumspective being-in-the-world can be made under certain conditions possible objects of knowledge. This is why the possibility of space as an entity that can be thematically objectified is laid bare not within the epistemic subject-object relation: *Space is not in the subject, nor is the world in space*. In stressing the pre-epistemological origin of space, Heidegger (1962, p. 146) indicates several lines of developing this claim. On his account, the possibility of objectifying space depends on the changeability of the circumspective deliberation inherent in making room within-the-world in an attitude of de-contextualizing spatial relations (of contextual involvements)

manipulation.⁴ Following this line of reasoning, he defines a context of equipment as a multiplicity of places that are not statically present-at-hand, but depend on the definite “here” and “yonder” that accompany the dealings taking place in the context. This is why the places that are circumspectively interpreted within a context of equipment are not to be catalogued by procedures that objectify space as a mathematical structure.

Roughly speaking, in introducing the “spatiality of being-in-the-world”, Heidegger is willing to demonstrate that there is a higher degree of spatiality’s “ontological autonomy” from the readiness-to-hand. This type of spatiality characterizes not what is going on within-the-world circumspectively, but rather the situatedness of the “circumspection of concern” in a world that is always already transcendent. Dasein is dealing with readiness-to-hand – so Heidegger’s argument goes – with familiarity just because this spatial dealing takes place “in” the world that transcends (as an open horizon) all particular contexts of equipment. It is the “transcendence of the world” that launches the spatiality of being-in-the-world. (The example Heidegger provides with regard to the abovementioned “ontological autonomy” is the left-right-directionality. Left and right are not something entirely dependent on Dasein’s concerned circumspection. They are directions of the directedness into a world that because of its horizontality is always already transcendent. Thus considered, left and right are directions of the spatiality that belongs to the “transcendence of the world”.)

The difference between both types of spatiality reflects to a certain extent the ontico-ontological difference since the spatiality of the ready-to-hand within-the-world can be established by a purely “ontic observation” whereas the spatiality of being-in-the-world requires an ontological reflection upon the transcendence of the world. In this regard, Heidegger goes on to lay the claim that the spatiality of being-in-the-world (as related to the transcendence of the world) provides the ontic possibility of Dasein’s environmental encountering of the readiness-to-hand. (This spatiality is generated by the “worldhood of the world”. But there is a worldhood because the world is transcendent.) In what follows, I will use the expression of “existential spatiality” for designating the dynamic unity of both types of spatiality in the process of meaning constitution.⁵

There is also another dimension in which both types of spatiality (or aspects of existential spatiality) are to be differentiated. Since the spatiality of being-in-the-world gets constituted by means of the way the world is transcending all kinds of subjectivity (including the inter-subjectivity of being-with-one-another), one should ascribe to this spatiality

localities. Merleau-Ponty is interested in “anthropological spaces” (including a wide range of abnormal cases) characterized by non-continuous deformations, i.e. deformations expressing essential heterogeneities.³ It is the transition from such spaces to isotropic constructions that plays the most important role in the existential genesis of mathematically codified concepts of space.

3. Types of Spatiality in Existential Analytic

The way of treating Dasein’s temporalized spatiality is not to be detached from the way of conceiving the world as a horizon that temporalizes itself in temporality. In advocating this claim, Heidegger distinguishes between the “spatiality of the ready-to-hand within-the-world” and the “spatiality of being-in-the-world”. The former is the closeness of utensils and equipment that Dasein implements in the circumspective manipulation within-the-world. This spatiality is a function of the closeness’ self-regulation in the ongoing articulation of contexts of equipment (*Zeugzusammenhänge*). Closeness expresses the contextual being of a utensil or equipment. (The rationale for claiming that closeness regulates itself is provided by the very nature of the worldhood of the world. To the changing configurations of practices within the world correspond changing connections among contexts of equipment. It is the changeability of both, configurations and contexts that provokes variability of the spatial locations of tools and equipment employed in circumspective manipulation.)

Heidegger attributes the “production of closeness” to the trans-subjective totality of interrelated practices and contexts of equipment. This production is irreducible to a purely subjective behavior. Furthermore, closeness is a function of the contextual involvements of a tool or equipment that is ready-to-hand in circumspective manipulation. Obviously, closeness cannot be measured objectively, since it is the circumspective manipulation within a context of equipment that ascertains whether the utensil is enough “to hand”. What gets ascertained is the place of the utensil within this context. Because spatiality is a complexity of contexts and environments that does not display characteristics of a dimensional space, the contextual place of a tool is not reducible to a position in a mathematical manifold of positions. By the same token, closeness or remoteness of a tool in a particular environment cannot be equated with a distance which is a purely geometrical notion applicable solely to metric spaces. Heidegger insists on the fact that closeness and remoteness are not measurable variables. They are entirely dependent on the contextuality of circumspective

interrelated practices.)

For Merleau-Ponty, by contrast, thanks to the bodily experience (or the “virtual body”) man is able to transcend the things, being thereby irreducible to an entity coexisting with those things. (The virtual body is the “phenomenal place” of the complexity of doings within the world as this place gets fixed by its situations and its tasks.) Through the bodily experience man is getting a status of existence “toward the world”. In other words, the world’s horizontality gets “generated” by man’s lived body which becomes the unconditioned starting-point of the constitution of meaning. Accordingly, man’s perception becomes the primordial level of meaningful spatializing the things of the world. It is the perceptive body that “breathes life into the world”. The virtual body is the only way of entering the world’s meaningful articulation. Since perception has a priority in bodily experience (and accordingly, in existence in and toward the world), it is the constitution of perceptive space that provides the point of departure of the constitutional analysis of meaning. From that perspective, the virtual body is ontologically equiprimordial with the world. It is the unity of body and world as a unity of mutual implication mediated by sense perception that brings meaning to light. This unity conditions the constitution of images of anisotropic space. A Merleau-Ponty-like “phenomenology of sensation” would allow one to identify the basic heterogeneities of lived space (including kinesthetic space, tactile space, visual space, and auditory space) that are to be taken into consideration when one concentrates on the pre-conditions for having a homogeneous (proto-mathematical) space with isotropic dimensionality.

To be sure, one can object with Heidegger against this privileging of lived body and perception by stressing the argument that man’s *Leibkörper* is always already within the world, and cannot therefore be used as a premise in giving an account of why the world is transcendent. Though I am inclined to accept this argument, there is an important problematic relevant to the genesis of mathematical spaces that is to be addressed from the viewpoint of Merleau-Ponty’s phenomenology rather than from that of Heidegger’s existential analytic. Strangely enough, Heidegger pays little attention to the most important moment in the existential genesis of space – the transition from the anisotropic spatiality of circumspective manipulation (and the concomitant original images of space) to science’s isotropic spaces. More specifically, Heidegger overlooks a topic that is of central importance in Merleau-Ponty’s phenomenology of bodily experience. This is the topic of how pre-scientific, anisotropic spaces (with their specific heterogeneities) become constituted. Phenomenology of bodily experience focuses upon asymmetries caused by

that the world becomes meaningful, which amounts to claiming that the constitution of meaning through the “understanding that interprets” takes place in the world. Since the understanding that interprets is always temporalized, attuned, discursively defined, and fallen (thrown in everyday practices), the constitution of meaning is also characterized by temporality, state-of-mind, discourse, and falling. In stressing that the interpretative appropriation of possibilities projected as a horizon of understanding implies that Dasein is constantly making room for its own leeway of actualized possibilities, one goes on to ascribe spatiality to the constitution of meaning as well. More specifically, one ascribes a local spatiality (environment) of readiness-to-hand to each context of equipment delineated by a particular configuration of practices. It is such a configuration that at once projects and appropriates possibilities, disclosing thereby a relatively autonomous environment. (Tentatively speaking, Dasein’s spatiality within-the-world consists of interwoven contextual environments.)

As a significant attribute of Dasein, spatiality has nothing to do with the intuitively justified idea that the totality of dealings within-the-world is present-at-hand in space. Moreover, Dasein is never a bit of space which its *Leibkörper* fills up. Yet Heidegger goes further in emphasizing that man’s corporeity is not a privileged starting-point of spatializing. In scrutinizing this claim, one is able to see the basic contrast of Heidegger’s approach to spatiality with Merleau-Ponty’s (1962, pp. 98-147) treating of “lived space”. Notoriously, Heidegger does not pay much attention to the role played by Dasein’s “bodily nature” (*Leiblichkeit*) in world’s articulation (in particular, the spatial articulation of contexts of equipment within-the-world). Indeed, he argues that bodily nature hides a peculiar problematic of its own. But at the same time he stresses that Dasein is spatial not because of its bodily nature, but because of its ability to transcend the things within the world, and to orient itself towards the world in a manner that is characterized by de-severance and directionality. These “parameters” of spatiality are to be rather assigned to the interrelatedness of practical dealings with what is ready-to-hand than to the lived body. By implication, the anisotropic and asymmetric space of Dasein’s bodily orientations (or, the space of circumspectively allotted places and localities) is due to the whole interrelatedness of Dasein’s practices that are projecting and actualizing possibilities of world’s articulation. (Practices initiated and carried out by man’s body are only an integral part of the totality of Dasein’s dealings that build up its circumspensive manipulation. To have a spatializing caused by man’s corporeity remains ontically possible – so Heidegger’s argument goes – only because Dasein itself is spatial with regard to that totality of

Heidegger launches in Sections 24 and 69(b) of *Being and Time*. Now, the question is whether Heidegger's existential analytic has resources to give an account of the transition from the contextual spatiality of everyday existence to geometrical space. This is the question I will address in the remainder.

2. Spatiality and the Constitution of Meaning

To begin with, there is an essential gap between the hermeneutic-phenomenological vocabulary by means of which one describes the spatiality of circumspective manipulation within-the-world and the language expressing the construction (and the epistemological criteria for existence) of space as a theoretically idealized object. This discrepancy is by no means surmountable through artificial linguistic means, suggesting supposedly a sort of commensurability between hermeneutic phenomenology and mathematical constructivism. From a methodological point of view, an inquiry into the genesis of mathematical space concepts in terms of existential analytic requires to recasting epistemological criteria of constructivism about formal objects in terms of Heidegger's hermeneutic version of constitutional analysis. Thus considered, the scenario of the existential genesis of geometrical spaces would involve an account of the formation of attitudes that are operating with the epistemological criteria in question. Consequently, one has to extend the constitutional analysis of meaning to cover the constitution of (geometrical) objects that are meaningful in those practices which are promoting the attitudes.

The kernel of Heidegger's hermeneutic version of constitutional analysis is expressed by the claim that Dasein understands itself in accordance with the possibilities it can appropriate and actualize in its ongoing dealing with what is ready-to-hand within-the-world. The possibilities are projected as an open horizon by contextual configurations of interrelated dealings (practices). This horizon serves the function of a horizon of Dasein's understanding. However, since Dasein is always in the world, the horizon of Dasein's understanding within contextualized practices (whose totality is what Heidegger calls the "worldhood of the world") proves to be at the same time the world as a horizon of understanding. There is a kind of double projection in this hermeneutic paradigm of constitutional analysis: on the one hand, practices in their interrelatedness are projecting possibilities; on the other, Dasein projects understandingly itself upon possibilities. The appropriation of projected possibilities within-the-world takes on the form of interpretative articulation of the world. It is by means of this articulation

environments. The projection of a structure that objectifies the homogeneous space has always its existential genesis within the contextualized dealings with what is ready-to-hand. The question of whether the same thesis is to be held with respect to all further specifications of “objective space” remains an open issue in Heidegger’s existential analytic.

In scrutinizing the genesis of the theoretical attitude out of circumspection, Heidegger observes that by committing to such an attitude, one overlooks not only the tool-character of what is ready-to-hand within-the-world, but also something that is inherent in ready-to-hand equipment – its place. The contextual location of a tool becomes a matter of indifference whereby a manifold of spatio-temporal positions begins to take shape. The theoretical attitude requires a formal closure of the manifold with regard to some invariant structure. The “mathematical projection” of such a structure – so Heidegger’s argument goes – transforms the manifold of spatio-temporal positions into a formally codified space. What is decisive in the mathematical projection is that this projection discloses something that is *a priori* for theoretical idealizations about empirical phenomena. In other words, the mathematical codification of space discloses at the same time a possible domain of empirical theorizing.

Heidegger never attempted to carry out the program of the existential genesis of geometrical spaces out of the spatiality of circumspective manipulation within-the-world. No doubt, his sketch of the program echoes motifs of Oskar Becker’s (1923) important inquiry (acclaimed by Husserl in his correspondence with Hermann Weyl) into the phenomenological foundation of geometry published in 1923.² However, Becker does not go beyond Husserl’s transcendental phenomenology, claiming accordingly that by bracketing the *a priori* contingency of the axioms of Euclidean geometry, one gains the chance of applying the “principle of transcendental idealism” to constitutional analysis of geometrical space. Notoriously, in his later work on “mathematical existence” Becker changes the paradigm of constitutional analysis by moving from transcendental phenomenology of consciousness’ life to Heidegger’s hermeneutic phenomenology. In so doing, he clearly distinguishes between the issues concerning the existence of mathematical objects and the mode of existence by means of which the construction of such objects becomes possible. Consequently, Becker adheres to the distinction between mental-procedural construction (as expressed by criteria of mathematical constructivism) and phenomenological constitution in terms of existential analytic. Yet it is exactly this distinction that

being-in-the-world, while the more restricted groups (including those of Euclidean geometry and metrical geometry that conserves the property of distance) are arising out through enhancing geometrical idealizations already existing. According to him, the homogeneous (topological) spaces as expressed by continuous transformations, which are bringing the new points into a one-one correspondence with the old points, are closest to the pre-scientific image of space (as generated immediately by the “existential spatiality” within-the-world). The topological transformations not only preserve spatial properties of objects which are under continuous deformations, but also keep intact to a certain extent the idea of “place” or “locality” (as basic moment of the spatiality of circumspective manipulation). It is another question that localities in the spatiality of circumspective compartment within-the-world are related to an anisotropic heterogeneity of spatial relations that is incompatible with space’s homogeneity implied by the topological transformations.

The intended program of searching for an existential genesis of geometrical space is to be placed in the context of Heidegger’s existential interpretation of science. It is a genesis out of the spatiality of circumspective manipulation, or the spatiality that belongs to the ecstatic unity of Dasein with what is ready-to-hand within-the-world. “Objective space” is a cognitive structure that becomes possible when the ecstatic unity is replaced by an epistemic distance between knowing subject and objective reality. A particular aspect of the way this structure gets established consists in transforming the “locations” of things that are ready-to-hand in everyday practices into “world-points” which are released from specific “environmental confinements”. The existential environment becomes a homogeneous space. It can be detached from Dasein’s concerned circumspection, and analyzed with regard to its own properties that are independent of the ecstatic existence within-the-world. The independence itself is “guaranteed” by the group of transformation that preserves space’s basic properties invariant. Put differently, the projection of an abstract mathematical structure allows one to disentangle space from the spatiality of Dasein’s everyday being-in-the-world. Yet before this projection takes place, there is a “tendency” in everyday mode of being-in-the-world towards objectifying whole regions of entities present-at-hand. (An outcome of this tendency is the plurality of pre-scientific images of space stressing various asymmetries and anisotropic features.) The projection of mathematical structure (group of transformations) is not to be isolated from an interrelatedness of practices that articulate context and

them being distinguished by concomitant kinds of temporalizing of temporality. What gets temporalized is the ways of making room for a meaningful articulation of the world. A case in point here is the way of making room for anticipation that indicates Dasein's ownmost potentiality-for-being, or the way in which the "authentic future" is winning itself from the "inauthentic future". In addressing this issue, Heidegger makes the case that the way of making room for anticipation (as opposed to awaiting of inauthentic future) constitutes the spatiality of resolute existence. To be sure, however, the problematic of this spatiality has little to do with the issues of the aforementioned program. What is significant for the latter is that the spatiality of being-in-the-world privileges various directions of circumspective manipulation. The pre-scientific images of space reflect these privileged directions. By implication, the "oriented space" of routine everydayness is essentially anisotropic. The most important step on the way to geometrical concepts of space is the change of anisotropic images in isotropic constructions.

The "series of stages in laying bare pure homogeneous space" Heidegger refers to is to be continued by another series distinguished by moves from one to another formally codified spaces, i.e. from one to another group of transformations, each of which determining a class of possible spatial objects one can construct in the framework of a certain geometry. Accordingly, such a group defines criteria of existence of spatial objects as characterized by invariant (with respect to the algebraic transformations) properties. Thus, only some very general properties (such as sidedness, insiderness, outsiderness, and all "connectivity properties") can be identified as invariant under the most extended group of topological transformations. If one is in need of a stronger idealization (formalization) of the concept of space, one has to restrict the topological transformations (as defining the morphology of spatial shapes), specifying thereby the group of projective transformations. The latter do not preserve sizes or angles. Yet the relations of incidence and cross-ratio remain invariant under this group. In a next move one arrives at the transformations of affine geometry which in contrast to projective transformations preserve the property of parallelism. Under this new group the properties of the homographic spatial objects are invariant.¹

Following his scenario of the existential interpretation of science, Heidegger believes that the most extended group of algebraic transformations of geometrical relations has a genesis from contexts of spatializing within the circumspective manipulation of the everyday

1. Introduction

In Section 24 of *Being and Time*, Heidegger announces a program for treating the stages of conceptualizing spatial relations within the scope of existential analytic. It is a program of investigating the “existential genesis” of the main geometrical concepts of space. Heidegger (1962, p. 147) states: “When space is intuited formally, the pure possibilities of spatial relations are discovered. Here one may go through a series of stages in laying bare pure homogeneous space, passing from the pure morphology of spatial shapes to *analysis situs* and finally to the purely metrical science of space.” Immediately after outlining the sketch of this investigation, Heidegger declares that it will not be undertaken in the present book. Yet the study of the existential genesis of mathematical space is by no means a “side-program” within the scope of fundamental ontology. Searching for this genesis is *sine qua non* for overcoming that hypostatization of mathematical space that characterizes the ontological approach to the world as *res extensa*. Thus considered, it is a prerequisite for destructing the “ontology of presence” (*Vorhandenheitsontologie*). Not by accident, in *Being and Time* the announced sketch of the program supervenes on the hermeneutic critique of the Cartesian conception of the world.

To be sure, there is an important “mathematical dimension” in Heidegger’s sketch. Obviously, what he has in mind in stressing the “series of stages” is a kind of Felix Klein’s hierarchy of geometrical spaces. Heidegger believes that by addressing the problematic of spatiality of circumspective manipulation within-the-world from the viewpoint of the role played by existential analytic as a kind of (phenomenological) constitutional analysis of meaning, one would give an account of changes in the pre-scientific articulation of spatial contexts of routine practices leading to the need of conceptualizing and formalizing space.

Tentatively speaking, spatiality is a “secondary” existentials grounded upon the primary attributes of Dasein’s care – interpretative understanding, discourse, state-of-mind, and fall. As a constant process of making room within-the-world, spatiality is always temporalized, i.e. there is no spatiality beyond the horizon of temporality. Thus, spatiality is always interpretatively understood, expressed within a configuration of discursive practices and by means of a certain discursive genre, thrown in the average everydayness, and temporalized. At the same time, one might speak of the “spatiality of understanding”, “attuned spatiality”, “spatiality of discourse”, and “spatiality of falling”, all of

From Existential Spatiality to the Metric Science of Space (An Attempt at Reconstructing an Aspect of Existential Analytic)

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Abstract

This paper is intended to be an account of existential spatiality based on an analogy with Heidegger's way of treating the issues of ecstatic temporality. The paper first situates the nexus of "existential spatiality and formal space". It then proceeds to the role of the various types of spatiality in existential analytic. There are certain parallels with Merleau-Ponty's phenomenology of bodily experience. Finally, the scope of existential spatiality is delineated.

Keywords: *Horizontality world, Metric Science, Merleau-Ponty, Dasein, Phenomenology, Existential analytic*

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