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Implications between teleological advancement and the return to origins: the adventure of Geometry in Husserl

Implicações entre avanço teleológico e retorno às origens: a aventura da Geometria em Husserl

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ABSTRACT

The present paper focuses on Edmund Husserl´s manuscript known by the title "The Origins of Geometry". The first part of the paper addresses the Husserlian hypothesis according to which there would be a mutual implication between teleological advancement and the return to origins in the sciences and notably in Geometry. The second part investigates the changes from the pre-geometric world to the universe of univocal accuracy. Finally, the paper addresses the conditions for the birth and transmission of Geometry in Husserl´s conception: the oral language, the intropathic connections and, above all, the written notation.

Keywords: Edmund Husserl; origins of geometry; oral language; intropathy; written notation.

RESUMO

O presente artigo concentra-se no manuscrito de Edmund Husserl de 1936, conhecido do grande público sob o título de "A origem da Geometria". A primeira parte do artigo aborda a hipótese husserliana segundo a qual haveria uma implicação mútua entre avanço teleológico e retorno às origens nas ciências e, notadamente, na Geometria. A segunda parte examina a passagem do mundo pré-geométrico ao universo da exatidão unívoca. Por fim, o artigo aborda as condições para o nascimento e transmissão da Geometria na concepção de Husserl: a linguagem oral, as conexões intropáticas e, sobretudo, a notação escrita.

Palavras-chave: Edmund Husserl; origem da geometria; linguagem oral; intropatia; notação escrita.

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Introduction

Conceived as a *sui generis* cultural form born among the Greeks, for Husserl, philosophy must exercise, in European humanity, the "*archontic*" function of all humanity (*Funktion als die archontische der ganzen Menschheit*) [1]. The ideal of philosophical reason becomes, as an "idea of an infinite task" (*Idee einer unendlichen Aufgabe*), a guiding idea of the spiritual evolution of European man, as the author states in his Vienna Conference in 1935[2]. In this same conference, Husserl is categorical in affirming that the particular sciences (*Sonderwissenschaften*) would consist of systematic ramifications of Philosophy[3] itself. In general, the sciences are guided by an ultimate idea: that of establishing themselves as "authentic science" (*echter Wissenschaft*), aspiring to reach truths that could be valid "once and for all and for everyone" (*ein für allemal und für jedermann gültig*)[4]. As Husserl explains in § 9 of *The Crisis of European Sciences* (1936), the sciences advance, from hypothesis to hypothesis, always towards infinity, guided by this final idea[5]. Every hypothesis is, by definition, partial and, therefore, capable of being corrected. This does not prevent, however, despite the partial character of scientific achievements, that the sciences – as "branches of a Philosophy" (*Zweige der einen Philosophie*)[6] – experience the claim of this greater final idea – that everything that is brought to scientific enunciation can be said once and for all.

Roughly speaking, guided by this final idea, aspiring to ever more perfect achievements, the sciences could not advance, in teleological terms, if they could not, in the judgmental thinking that is characteristic of them, based their judgments on the evidence of a state of affairs. With the teleological march of science, we see that the notion of "progress" (*Progressus, Fortschritt*) does not result from a fortuitous "beginning and end" (*Anfang und Fortgang*), but rather, it would be founded, as Husserl tells us, "in the nature of things themselves" (*in der Natur der Sachen selbst*)[7] and, more specifically, in their evidence. We already have here, one could say, the idea of an advance based

[1] Husserl, E. "Die Krisis des europäischen Menschentums und die Philosophie". In: Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1935] 1976), I, p. 336.

[2] *Idem, I, pp. 336/338.*

[3] *Ibidem, I, p. 321.*

[4] Husserl, E. Cartesianische Meditationen und Pariser Vorträge. Husserlian (Band I). Den Haag, Netherlands: Martinuos Nijhoff, ([1931/ 1929] 1973), § 4, p. 58.

[5] Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), § 9, "e", p. 41.

[6] Husserl, E. "Beilage II, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 363.

[7] Husserl, E. Cartesianische Meditationen und Pariser Vorträge. Husserlian (Band I). Den Haag, Netherlands: Martinuos Nijhoff, ([1931/ 1929] 1973), § 4, p. 53.

on a return. But if Husserl sometimes insists on this point, it is above all to continue to move forward, in the 1930s, what was perhaps his last great effort to denounce the sciences of his time that would not fail to promote, without realizing it, a certain rupture in the unity between the teleological march of scientific achievements and the principle of basing their own judgments on the evidence of things and states of affairs. This rupture has, in a certain way, a "tragic" character, since these sciences would become responsible for the formation of the mentality of European man, whose spiritual collapse became flagrant after the First World War. In any case, the etiology of the crisis of this humanity refers to the crisis of the sciences which, in turn, end up, in Husserl's terms, by "substructing" the pre-geometric sensible world, a kind of "subsoil" (*Untergrund*) of all scientific idealizations and of Geometry itself, dressing it in a "garb of ideas" (*Ideenkleid*), of numbers and algebraic operations, as if Nature were mathematics[8] in itself. Here, in summary, is the content of the letters of the famous § 9 of the Krisis text.

And already in letter "a" of the paragraph in question, in which the author seeks to describe aspects of the pre-scientific world (prior to scientific ideals themselves), the reader comes across three appendices. The third of these – a manuscript dated 1936 – was published in 1939, through Eugen Fink, notably in issue 2 of the *International Review of Philosophy of Brussels*, under the title "The Question of the Origin of Geometry as an Intentional-Historical Problem" (*Die Frage nach dem Ursprung der Geometrie als intentionalhistorisches Problem*). Later inserted in volume VI of the Husserliana as Annex III of letter "a" of § 9 of the *Krisis*[9], the text would become, in the 1960s, under the title *L´origine de la géometrie*, known to the general public through the translation – and a long Introduction – made by the French philosopher Jacques Derrida (1930-2004) [10]. It is necessary to understand, therefore, that the manuscript in question must, on the one hand, be inserted as an "accessory" annex to the set of problems of § 9 (notably letter "a") and, on the other hand, it ends up achieving a certain independence – a "marginal" character – in relation to this paragraph. But, after all, what makes this manuscript so important in the last years of Husserl's life and, notably, for the clarification of the teleological doctrine of sciences? This is what we will examine in this article.

[8] Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), § 9, "b", p. 26.

[9] Husserl, E. "Beilage II, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie.* Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976),

[10] Derrida, J."Introduction". In: Husserl, E. *L´origine de la géometrie.* Paris: PUF. Epiméthée, ([1962] 2010), pp. 3-171.

Mutual implication between teleological advancement and return to origins

As we saw above, Husserl understands that sciences cannot authentically advance in their teleological march if they cannot base the judgments they formulate about their objects on the evidence of a state of affairs. There is already something like a game of reciprocity (or mutual implication) between the teleological "advance" of the sciences and their "return" to the things themselves. The breaking of this connection would reveal the diagnosis of the crisis experienced by the sciences. In a certain way, the synthesis between the advance and the return in question is decisive in the elucidation of the teleological doctrine of the sciences. But perhaps, as at no other time, has such a synthesis been so deeply addressed as in the manuscript of the Origin of Geometry. In it, Husserl seeks to provide the reader with a phenomenological description of the spiritual genesis of Geometry, understood as a branch of pure mathematics and an extract in the teleological march of the sciences. But why exactly Geometry and not any other science? Here it is important to remember that the crisis in science is the result of what Husserl identifies as a "substruction" (*substruierende*) of the world by a process that, from Galileo onwards, gradually leads the pure forms of Geometry to an "algebraic arithmetic" (*algebraischen Arithmetik*), that is, geometric figures would first receive a numerical treatment in which the numbers used would, in turn, together with letters, connection and relation signs (+, x, =, etc.), compose algebraic equations, through which science could then elaborate "numerical formulas" (*Zahlformeln*)[11]. All this, in the name of an obstinacy to exponentially increase the predictive capacities of science, as well as its technical improvement. And when we talk about a technical application of science in general, Geometry gains a prominent place, since from an early age and therefore prodigiously, it revealed its vocation to serve the interests of practical life. But, despite this specificity, Geometry does not cease, as a branch of pure mathematics, to be inserted in the teleological march of sciences (what is true for Geometry is true, to a large extent, for sciences in general) (*Dasselbe gilt für jede Wissenschaft*)[12]. However, the "adventure" of its advancement in this march could not, properly, be understood without a "question of return" (*Rückfrage*) to its origins, without us questioning the "original meaning" (*ursprünglichen Sinn*) that marks its birth[13]. After all, it never ceases to build itself, as Husserl states,

[11] Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), § 9, "g", p. 46.

[12]Husserl, E. "Beilage II, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie.* Husserlian. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 367.

[13] Idem, p. 365. After all, as Franck Robert points out: "...every genesis of meaning requires a Stiftung, an original foundation". Robert, F. "Presentation". In: Merleau-Ponty, M. *Notes de cours sur L´origine de la géométrie de Husserl*. Suivi de *Recherches sur la phenomenology de Merleau-Ponty*. Paris: PUF, 1998, p. 7.

in the "vividness of uninterrupted work" (*lebendiger Fortarbeit*) [14], bringing with it this meaning, remaining, despite the new forms acquired, as an ancient tradition, thus remaining as "the" Geometry ("*die*" *Geometrie*) (as we know it, as transmitted by our ancestors) [15].

The aforementioned manuscript effectively puts into practice a methodological procedure of advancing and retreating in a "zigzag" (announced in letter "l" of § 9 of the *Crisis*)[16], whose dynamics consists either in describing the teleological advance of Geometry, or in promoting a return – one could say, "archaeological" – with a view to clarifying the "how" of its birth and its transcultural propagation. In other words, the incessant, authentic and living advancement of Geometry could not be properly understood without the elucidation of its original spiritual motivations, which accompany it throughout this teleological march. Here too, advance and return play a reciprocal game, in which the clarity of one brings the elucidation of the other, reflecting again the opposite side, as Husserl tells us[17]. As it advances towards its "horizon of geometric future" (*Horizont geometrischer Zukunft*), Geometry ends up extracting new geometric figures that presuppose, as if we were facing a great "spiritual architecture", the figures extracted previously that, in turn, would presuppose the most elementary figures (segments of straight lines, circles, triangles, etc.). However, Husserl warns us, it is not just a movement proceeding without ceasing from acquisition to acquisition, but a continuous synthesis in which all acquisitions persist, preserving the sense of being of Geometry, all forming a totality, so that, in each present, the total acquisition is, one could say, the total premise for the following stages[18]. Looking towards its geometric future and bringing with it the totality of its past, Geometry finds itself in this type of movement, so that each geometer is aware of being engaged in a continuous progression (within this architecture, no piece is independent of the others, forming a "single theory that is solidary of all its parts")[19]. There is, therefore, in the description of this so-called "adventure" of Geometry, a temporality inherent to the teleological march itself, in which we witness the mutual implication between the geometric future and its original past.

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[14] Husserl, E. "Beilage II, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 366.

[15] *Idem*, p. 365.

[16] Como diz o autor: "temos de ziguezaguiar para frente e para trás" ("*wir müssen im Zickzack vor- und zurückgehen"*). Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), § 9, "l", p. 59.

[17] *Idem*, § 9, "l", p. 59.

[18] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 367.

[19] Merleau-Ponty, M. *Notes de cours sur L´origine de la géométrie de Husserl*. Suivi de *Recherches sur la phenomenology de Merleau-Ponty*. Paris: PUF, 1998, p. 19.

But the understanding of this process becomes empty without an archaeology of the formation of the most primitive sense through which Geometry entered History, constituting itself as an ancient tradition. After all, if the incorporation of new geometric forms presupposes the previous ones, in a first beginning back at the origin, there were no presuppositions for the most elementary figures of Geometry, but something like an inventive action that instituted a new way of thinking. Necessarily and a priori, something then happened there, regardless of who, in a history of facts, the first geometers were. It then becomes unavoidable to have a genealogy capable of returning to the origins of Geometry and, consequently, to its pre-scientific "underground". And what do we find in the prehistory of Geometry? This is what we will examine from now on.

In the "underground" of Geometry: from more or less to univocal accuracy

Husserl dedicates to letter "a" of § 9 of Part II of the Crisis of Sciences, as well as to Appendix II of this letter, a description of man's original relations with the things around him in the life of pre-scientific experience (*Im vorwissenschaftlichen Erfahrungsleben*)[20]. We are faced with communities of men, with things to which they refer and, as a backdrop, with the world to which they belong (understood as a horizon of their existences, of their real and possible concerns). In spiritual commerce with each other, forming communities of language, these men refer to the things of their surrounding world, identifying them through morphological types (such as "round", "linear", etc.). Such "types" ensure that this humanity has the possibility of re-identifying, albeit inexactly, things around it. But this pre-scientific sphere of men's relationship with the world is also a sphere of oscillations, of a "Heraclitean river" (*heraklitischen* Fluβ) of "sensory-thing" (*sinnendinglichen*) data (as Husserl prefers in Appendix II)[21], an oscillation of that which is of the order of a "normal empirical typology" (normalen *Erfahrungstypik*) (the identity of things with themselves, their "being equal to themselves" and temporarily enduring in equality is a mere approximation). After all, things that "fall" under a certain type are found, in a given context, as more or less round, linear, smooth, etc., always in a somewhat imprecise gradation. Some of them appear, at a given moment, more perfect than others, varying as we move from one context to another. Such imprecision does not generally affect the habitual practical life of men who, in turn, already make use of a system of measurements, although its scope is also limited and, in this sense,

[20] Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), "Beilage II, zu § 9a", p. 357.

[21] Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), "Beilage II, zu §9a", p. 357.

one could say for domestic purposes. We have, then, a pre-scientific scenario in which men refer to "morphological types" which, in short, are like "inaccurate" objective idealities (but which end up playing an important role, however, in the record of that which is "more or less" perfect). In addition, such men already make use of a theory of measurement, but of limited scope, since it is restricted to meeting small demands and more immediate interests of practical life (such as counting the sheep that return from pasture at the end of the afternoon, for example)[22].

If at first the contextual oscillations, the inaccuracy in the use of morphological types and the limitation of the measurement technique do not bother men, meeting their everyday interests, little by little, such aspects of the pre-scientific relationship of men with the world will meet the interests of some, but no longer of all. After all, these oscillations make it impossible to transmit – unequivocally and exactly – the identity attributed to things by men. In the world of "more or less" or "approximately" (as an old collaborator of Husserl in Göttingen, the French philosopher of Russian origin, Alexandre Koyré, would say in his 1948[23] article), things cannot persist identically as the same beyond the context in which they are inserted[24]. It is important to highlight that the intention of equality in land preparation in surveying, in housing construction projects, etc., would not fail to indicate a harbinger of change in this scenario. This intention is accompanied by a demand for greater accuracy in description, for a theory of measurement with greater scope and for an interest in what is technically more refined in an open horizon of improvement, in which the ideal of perfection slides "ever further" (*immer weiter hinaus*)[25]. Husserl then dwells, in the midst of this description of the pre-scientific world, on the most primitive original motivations, responsible for the birth of Geometry and, notably, for its insertion in History. He focuses on the figure of a proto-founder of Geometry, whose founding action arises from the relationship of this individual with the raw material (not idealized in terms of accuracy) of the pre-scientific world. The author is clear in the manuscript of the Origin of Geometry that this description of the spiritual genesis of Geometry does not involve a philological-historical survey of who were the first geometers, responsible for formulating the first geometric propositions, demonstrations and

[22] As Alexandre Koyré reminds us: "For everyday uses, things were less demanding: calculations were made with index cards". In another passage, quoting the influential French historian Lucien Febvre, the author also states that: "There was no clear and well-defined nomenclature, nor standards of guaranteed accuracy, adopted by all with happy consent. There was an incoherent multitude of measurement systems that varied from city to city, from village to village, whether it was a question of length, weight or volume..." Koyré, A. "From the world of more or less to the universe of precision". In: Galileo and Plato. Lisbon: Gradiva, ([1948] 1986), pp. 68/71

[23] Koyré, A. "*From the world of more or less to the universe of precision*". In: Galileo and Plato. Lisbon: Gradiva, ([1948] 1986), p. 60.

[24] In this same pre-scientific domain, Koyré states that: "there is everywhere a margin of imprecision, of 'play', of 'more or less' and of 'approximately'". Idem, p. 61.

[25] Husserl, E. Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), § 9, "g", p. 23.

theories[26]. Even though, in general, we know nothing or approximately nothing about what actually happened at the beginning, it must be said, the author tells us, that in this "not knowing" (*Nichtwissen*) there is always and essentially an "implicit knowledge" (*implizites Wissen*), whose hidden presence calls us to its explanation[27]. Since Geometry had a first beginning, a first acquisition from which it could insert itself into History, it is necessary to promote, in the author's terms, a "question of return" (*Rückfrage*), understanding, through a genealogical procedure (through a "history of the depths", "without dates", in Merleau-Ponty's terms)[28], what would have happened for such insertion to become possible. As Husserl tells us: "past men and humanities existed, to which belonged the first creators who, from available, raw materials, and already informed by the spirit, gave shape to the new"[29]. But what, after all, would have happened, for the succession from the "non-geometric" to the "geometric" to take place? Let us see.

Conditions for the birth and establishment of Geometry in History

Immediately, for this succession to take effect, it was necessary for a proto-founder to have intuited the project (*Vorhabe*) of an exact science of measuring the Earth (a "Geo-metry"), pure mathematics of spatial figures. But he could also have foreseen the effective success of this project among men (in the sense of dealing with exact objective idealities, transmitted at all times and places; idealities whose unconditional validity would authorize an application independent of contexts). Such a project would contain a univocal method in which geometric figures could be gradually extracted from more elementary figures, such as straight lines, circles, triangles, preceded, in turn, by a plane and its infinite points on which infinite segments of straight lines would intersect. This opened up, and this was, according to Husserl, the great discovery responsible for the creation of Geometry, the possibility of generating, through this systematic and univocal method, all ideal figures that are *generally imaginable*[30].

[26] Husserl, E. "Beilage II, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 366.

[27] *Idem*, p. 366.

[28] Merleau-Ponty, M. *Notes de cours sur L´origine de la géométrie de Husserl*. Suivi de Recherches sur la phenomenology de Merleau-Ponty. Paris: PUF, 1998, pp. 18/35.

[29] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 366.

[30] Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), § 9, "a", p. 24.

But Husserl does not hesitate to ask himself the following question: if the intuition of this project arises from the psyche of a proto-founder, how could geometric ideality (*geometrische Idealität*), exact (absolute and universal), capable of intersubjective and transcultural propagation among men, arise from this, from an intrapsychic (*innerpersonalen*) and, therefore, "psychological" domain?[31] After all, when we refer to the same ideal objectivity (*idealen Objektivität*), as occurs with geometric objects, we refer to something of the order of a "being-there", accessible, objectively, to anyone ("*jedermann*"), "to real and possible mathematicians of all peoples, of all centuries, and in all their particular forms"[32]. What were the conditions for the emergence and unequivocal outbreak of such ideals among this humanity, beyond the psychic life of this proto-founder? Without a doubt, the prodigious character of Geometry to serve, unequivocally and on an infinitely larger scale, practical life had its importance in accelerating the dissemination of Geometry. But this does not explain how this transition from what was intrapsychic to what became intersubjective took place.

Initially, Husserl draws our attention to a certain subjective capacity of the one who foresaw the project of geometric science. It is necessary to highlight, firstly, in the intrapsychic sphere, that the intuited project became evident, "one day" (*dereinst*), in the actuality of a first production – of a present of the "first time" (*erstmalig*) – for the personal consciousness of this proto-founder[33]. However, this original evidence does not give rise to any persistent acquisition that could objectively remain the same (as we see in geometric objects), since, as a "living" evidence, it is transitory and degenerates quickly, fading away in a temporal flow, in which what was retained finally vanishes. But the faded past can be, Husserl points out, actively awakened and revived, through a faculty of reactivation, capable of reproducing, with evidence, what was intuited. However, the author clarifies that we are still within the scope of the subjective faculties of this proto-founder and, consequently, we are not yet assured of any guarantee of objectivity like that found in geometric objects.

In any case, such capacity for reproduction required, in turn, that this individual could, linguistically, express what he himself intuited as a new project of idealization. This would not be possible if he did not have at his disposal language and the immense extent of its consignments (of what it itself makes possible in terms of transmission), if he did not constitute, with other men, a

[31] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 369.

[32] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 368.

[33] *Idem, p. 366*. As Merleau-Ponty points out: *"...in this original act, geometry is nothing but a moment of personal life*". Merleau-Ponty, M. *Notes de cours sur L´origine de la géométrie de Husserl*. Suivi de *Recherches sur la phenomenology de Merleau-Ponty*. Paris: PUF, 1998, p. 24.

language community (*Sprachgemeinschaft*), allowing, intersubjectively, the expression of geometric objects for himself and for others with whom he habitually interacts. In addition to the function of language, together with this community of men, there is a capacity for intropatic connections (of putting oneself in the place of the other, assuming him as someone capable of understanding, in a communicative discourse, what is being transmitted). This community is therefore a community endowed with the function of language and a reciprocal capacity for understanding. In this sense, humanity is for each man a community that can express itself in reciprocity, so that in it everyone can also refer to an objective state of everything that is there, in the world surrounding this humanity[34]. In mutual understanding through language, this community of men sees the original production being re-understood by its members[35]. As Husserl points out, human productions can propagate in a community of people, penetrating in the same way into each other's consciousness[36].

However, such functions of language and intropatic connections are not enough to prevent Husserl from returning, in the manuscript of the Origin, to the question initially posed: what made geometric objects endure intersubjectively, identically as the "same," beyond the psychic life of the one who intuited the project of Geometry itself? [37] Despite the importance of language and intropy for Geometry to be able to constitute itself, through transmission, as a tradition among men, Husserl warns us that such functions would not, by themselves, ensure the intersubjective permanence of geometric idealities – in the sense of an "enduring presence" (*verharrende Dasein*) or of a "being forever" (*immerfort-Sein*) of such idealities that would persist in time, even if their inventor (*Erfinder*) were no longer alive. After all, if oral communication freed such ideals from the intrapsychic life of this inventor of geometry (allowing, albeit in a restricted way, a sharing of them with other men), it was not, however, enough to free it from the community in which it was instituted. Would exile in this community of protogeometers be the inevitable destiny of geometric objects? Husserl will show that not exactly.

Despite this insufficiency, there is something special about language that Husserl will identify as assuming a decisive role in the introduction of geometry into history. This is a decisive

[34]Husserl, E. "Beilage II, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 370. As Franck Robert points out: "The power to express oneself and intersubjectivity thus become the very possibility of objectivity". Robert, F. *"Presentation". In: Merleau-Ponty, M. Course notes on the origin of Husserl's geometry*. Followed by research on Merleau-Ponty's phenomenology. Paris: PUF, 1998, p. 7.

[35] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 371.

[36] *Idem*, p. 371.

[37] *Ibidem*, p. 371.

moment in the text of The Origin of Geometry. Husserl turns to the language through which geometry could be transmitted, not in the sense of making a philological study of it, but in order to emphasize an aspect that, in the author's eyes, will be decisive. Husserl then compares the objective idealities of Geometry with the other idealities of the language spoken by men[38]. The author draws our attention to idealities whose semantic content remains the same, despite their connection with the historical context of a given language. For example, the words "*Löwe*" (in German), "Lion" (in English), "*Lion*" (in French) refer us, despite their physical differences (the graphic aspect and the complex phonic articulation used to pronounce them) and historical differences in the respective languages, to the same ideal unit of meaning which, in this case, is found, as the same, let's say "linked" to each of these languages. However, when it comes to geometric objects (segments of straight lines, circles, triangles, etc.), we do not find such a link, in the sense that the geometric idealities are identical in all languages. In other words, there is no translation of a geometric figure from one language to another, which makes it fully transmissible among communities of men, without there being any connection to this or that spoken language (after all, as Husserl reminds us: "Geometry is identically the same in the 'original language' of Euclid and in all 'translations'")[39].

But it is precisely here that a point deserves to be highlighted: Geometry as a branch of pure mathematics presupposes a theory of the measurement of angles, distances, etc. (and therefore presupposes a theory of numbers) which, in turn, necessarily relies on "written notation"[40]. A theory of numbers could not develop without being able to rely on such notation and on everything that it makes consignable. And this would be true even for a rudimentary theory of measurement, such as that which we find in the prehistory of Geometry. Interestingly, if geometric idealities are not linked to languages (as we can see, for example, with the word "lion"), they nevertheless presuppose a theory of numbers and, in doing so, rely on written linguistic expression so that they can be transmitted as a human production that will be consolidated, in History, as tradition[41]. Here, we also find a certain paradox in the relationship between Geometry and language. Unleashed from

[38] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 368.

[39] *Sie ist identische dieselbe in der "originalen Sprache" Euklids und in allen "Übersetsungen"*; Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 368.

[40] As Mickaël Launay states: "It was certainly no coincidence that the need to write numbers proved to be so decisive in the emergence of writing. For if other ideas could be transmitted orally without problems, it seems difficult to establish a numerical system without going through a written notation". Launay, M. *The fascinating history of mathematics. From prehistory to the present day*. São Paulo: DIFEL, 2019, p. 30.

[41] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 366.

this or that language, free from any translation (since geometric objects, as such, permeate all languages), Geometry finds itself forced to return to language – notably, to the graphic sign – taking it, in Derrida's terms, as a kind of "guarantee of objectivity"[42], capable of ensuring, as Husserl says, "without direct or indirect personal address" ("...*ohne unmittelbare oder mittelbare persönliche Ansprache*")[43], its entry into History. Without writing (or "linguistic sedimentation")[44], language would still remain hostage to a given community of men who would interact with each other only through oral communication. In this sense, as Derrida points out: geometric objects must be "spoken and written" so that they can effectively be "emancipated" from the community in which they were instituted. "Paradoxically, it is the graphic possibility that allows the ultimate liberation of ideality," states the author in his famous Introduction to the text of the *Origin*[45]. With this double emancipation (oral and written), Geometry would finally take its definitive "flight" in History.

As has been said, understanding the progress of Geometry towards its future horizon, incorporating, as it advances, new figures that join the previous ones, becomes inseparable from a "question of return" to the original spiritual motivations responsible for the birth and transmission of the geometric project. In the beginning, something happened in the pre-geometric world. What happened, one could say, was a conversion of the inexact into the exact: what was more or less round turned into a "circle", what was more or less linear into a "straight line", and so on. Instead of morphological types by which men could re-identify things around them, in a gradation of greater or lesser roundness, linearity, etc., we now have – as a new genre of pure thought – exact objective idealities that are valid for everyone at all times, for all mathematicians (present or past). Instead of a "domestic" mathematics of limited scope, we now have a theory of long-range measurement (which allows us to operate with exponentially large numbers, in an algebraic language) and a univocal method in which new figures are extracted from elementary figures, such as straight line segments (which, in turn, suppose a plane and an infinite number of points), circles, triangles, etc. We have, then, at the origin, as a result of this inventive and founding action, a succession of conversions from the non-geometric to the geometric, an "original substruction", through which the "more or less" (inaccurate, limited, etc.) is converted into exactitude (into what is absolutely identical, objective, univocal, etc.). In Derrida's terms, the "imperative of univocity"

[42] Derrida, J. "Introduction". In: Husserl, E. *L´origine de la géometrie*. Paris: PUF. Epiméthée, ([1962] 2010), p. 92.

[43] Husserl, E. "Beilage III, zu §9a". In: *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), p. 371.

[44] Robert, F. "Présentation". In: Merleau-Ponty, M. *Notes de cours sur L´origine de la géométrie de Husserl*. Suivi de *Recherches sur la phenomenology de Merleau-Ponty*. Paris: PUF, 1998, p. 8.

[45] Derrida, J. "Introduction". In: Husserl, E. *L´origine de la géometrie*. Paris: PUF. Epiméthée, ([1962] 2010), pp. 87-88.

is consolidated, "...a condition for communication between generations of researchers, no matter the distance. It ensures the accuracy of the translation and the purity of the tradition."[46]

Final Remarks

Finally, Husserl is clear in stating that, as a tradition, Geometry could only advance authentically towards an infinitely open horizon of the future, incorporating new figures into the previous ones, to the extent that, in this advance, it preserved an objective intention of its beginning and its end. But Husserl warns that the possibility of an advance that did not become sensitive to the original motivations would be an empty and inauthentic advance (and, in a certain way, "dangerous"). Although Geometry has implied, since its origins, a theory of measurement and a vocation to serve practical life, this did not prevent it from undergoing, from Galileo onwards, as Husserl observes in § 9 of the *Krisis*, a new conversion in which pure geometric forms would be reduced to an "algebraic arithmetization", whose goal would consist, fundamentally, in exponentially increasing the capacity for prediction and improvement of measurement techniques to serve, more effectively, the interests of practical life. According to Husserl, practical utility became the main reason for the acceleration of science and, despite its soaring growth, such a conversion would not be without its price: that of emptying Geometry of its original meaning[47]. For Husserl, the ideals inherent in geometric thinking were transformed, so to speak, into algebraic operations (consisting of letters, numbers, signs of relation and equality). In the author's words: "In algebraic calculation, one automatically regresses, or even completely abandons, the geometric meaning."[48] All of this implied a new process of substruction. However, this time, under this new guideline, the sciences – and, notably, Geometry – began to advance disconnected from their end and, above all, insensitive to their beginning, which would not fail to constitute a growing danger for European humanity. In short, the crisis of this humanity becomes inseparable from the crisis of science and this is, in turn, the result of a break in the unity between teleological advancement and the return to the original motivations responsible for the insertion of science (and notably, Geometry) in History, separating what in this march has a mutual implication: the final idea towards which science advances teleologically and archaeology from its original meaning.

[46] Derrida, J. "Introduction". In: Husserl, E. *L´origine de la géometrie*. Paris: PUF. Epiméthée, ([1962] 2010), p. 101/103.

[47] Husserl, E. *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Husserlian. Band VI. Netherlands: Martinus Nijhoff, ([1936] 1976), § 9, "f", p. 44.

[48] *Idem*, p. 44.

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