URTIER, URPFLANZE, URPHÄNOMEN: GOETHE'S CONTRIBUTIONS TO THE NATURAL SCIENCES AND PHILOSOPHY

URTIER, URPFLANZE, URPHÄNOMEN: A CONTRIBUIÇÃO DE GOETHE PARA AS CIÊNCIAS NATURAIS E PARA A FILOSOFIA

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ABSTRACT: We attempt in this paper to present the development and internal nexus of the leading three ideas in Goethe's scientific endeavours: *Urtier, Urpflanze* and *Urphänomen.* Our goal is to contribute to the philosophical understanding of Goethe's role in the configuration and organization of the spirit of contradiction through which he and Herder tried to shake to its grounds the intellectual scenario of late 18th century in the not yet so modern German states. Goethe pretends to have diligently overcome Camper and the fixists in Zoology, Linnaeus in Botany and Newton in Optics. Those are no meagre deeds. And through them he opened doors and windows for a new concept of natural history – a truly historical one – no longer imprisoned within Leibniz's continuity principle: a concept for which time and experimentation (without anticipation) truly matter. In this sense, it will not be difficult to observe, or at least suggest, the many ways in which Goethe's scientific works may have had a central role in the configuration of Hegels insights into Nature and History.

KEYWORDS: Experience; Idea; Morphology; Nature

RESUMO: Buscamos neste artigo apresentar o desenvolvimento e o nexo interno das três mais importantes ideias das pesquisas científicas de Goethe: *Urtier*, *Urpflanze* e *Urphänomen.* Nosso objetivo é contribuir para o entendimento filosófico do papel de Goethe na configuração e organização do espírito de contradição através do qual Goethe e Herder buscaram chacoalhar até aos fundamentos o cenário intelectual do fim do século XVIII nos ainda não muito modernos estados alemães. Goethe pretende haver superado de maneira cuidadosa Camper e os fixistas na zoologia, Lineu na Botânica e Newton na Ótica. Não são feitos de pouca monta. Por meio deles Goethe abriu portas e janelas para um novo conceito de história natural – um conceito verdadeiramente histórico – não mais aprisionado dentro do princípio da continuidade leibniziano: um conceito para o qual o tempo e a experimentação (sem antecipação) realmente importam. Nesse sentido, não será difícil observar, ou pelo menos sugerir, os muitos modos em que os trabalhos científicos de Goethe podem ter tido um papel central na configuração dos insights hegelianos sobre natureza e história.

PALAVRAS-CHAVE: Experiência; Ideia; Morfologia; Natureza

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„Welch ein erhabner Gedanke; uns lehrt der unsterbliche Meister
Künstlich zu spalten den Strahl, den wir nur einfach gekannt."
Das ist ein pfäffischer Einfall! Denn lange spaltet die Kirche
Ihren Gott sich in drei, wie ihr in sieben das Licht.
(Goethe, Letter to Schiller from 10.10.1795)

1. Outline of the history of the reception of Goethe's scientific works[1]

Goethe is doubtlessly best known for his literary works, which have granted him an almost undisputed place among the greatest authors of the western literary canon. On the other hand, his scientific efforts, though much less well known and not having met with such universal acclaim, have undeniably played an important, if not downright fundamental role in the immense scientific, cultural, and philosophical revolution that took place in the late 18th century, which consisted mainly in the inauguration of the idea that natural species (and ultimately all orders taken as "natural") undergo change. Indeed, he pioneered the elevation of comparative anatomy and phytotomy to the status of a morphology, thus preparing the terrain for A. von Humboldt's outstanding achievements and deserving to be mentioned, even if mostly only marginally, by some of the other great exponents of this revolution, such as Geoffroy Saint-Hilaire, Augustin-Pyrame de Candolle and Charles Darwin. However, the further developments in science, especially along the second half of the 19th century, which established the hegemonic view of positivistic methodology, led to a readaptation of the old mechanistic-analytical procedures to the newly inaugurated evolutionary concepts. This gave rise to monstrosities such as Social Darwinism and cast a lasting shadow over the image of Goethe as a scientist, whose efforts were admitted to have, at best, 'artistic' or 'aesthetic' value, but hardly a strictly 'scientific' one.

[1] A first version of this paper was presented at the "3rd Collegio Ghislieri Graduate Conference in the History of Philosophy - Nature, History and uses of an idea between philosophy and science", which took place in Pavia, Italy, on October 12th and 13th, 2016. In 2017 and 2018, the text was revised and more bibliographical information incorporated in the footnotes, but the core of argument was left untouched. The concern that it lacked a more direct confrontation with Kant's *Critique of Judgement* led to delay its publication. But now our attempt is about to complete ten years, and it would seem to quit it altogether if we did not undertake a last effort to make it see the light of day, even though somehow incomplete and ignorant of the new bibliography published on the subject in the last ten years.

On the other hand, the reception of Goethe's scientific works among philosophers and literates can be said to have been much more diverse and fruitful, albeit also never entirely – or at least explicitly – positive. Maybe the only significant almost 'enthusiastic', while still critical, receptions were those of Schelling, Hegel, and Schopenhauer, as well as, about a century later, those of Ernst Cassirer, Ernst Bloch and Walter Benjamin, who may very well have been the few to grasp the seriousness and historical urgency of Goethe's scientific project. Schiller, and later Heine, saw in Goethe's scientific endeavours no more than the manifestation of his political indifferentism, or the signs of a mind confused by a very personal contradiction: that between the Goethe from the *Sturm und Drang* movement and the Goethe *Hofrat* in Weimar.[2] In seeking refuge in nature, Goethe was supposedly doing no more than elude the politics of the inflamed years of the French Revolution. This judgement led Heine, and with him Marx and the radical fringes of the movement that lead to *Vormärz*, to denounce what was perceived as bourgeois contradictions in Goethe's works, and to limit the question to the dichotomy of being either a radical democrat or a radical scientist. Later on this track, Benjamin, although one of the few to have a deeper insight into Goethe's method, claimed that Goethe lacked a concept of history, having let himself be taken captive by destiny and myth, out of which he produced an apolitical "idolatry of nature".[3] This opinion seems to have prevailed in the leftist reception of Goethe's project.

Then again, it cannot be ignored that Husserl's critique of mathematical (viz. formalistic) colonization of the European scientific spectrum is converging with many a Goethean point of view in several aspects – albeit Husserl himself does no more than occasionally hint to such an affinity, without ever having explored it at length.[4] This trend continued among most of the heirs of Husserl's phenomenology. In Heidegger's *Sein und Zeit*, for instance, Goethe is prac-

[2] HEINE, H., **Die Romantische Schule**, Stuttgart: Reclam, 1985, p. 42-44.

[3] BENJAMIN, W., Goethes Wahlverwandtschaften in: idem, **Gesammelte Schriften**, I, 1, Frankfurt a. M.: Suhrkamp, 1991, p. 149. Although Benjamin was still able to derive from Goethe's scientific endeavours many a keynote to the "Erkenntniskritische Vorrede" to his *Ursprung des deutschen Trauerspiels* (1928), the works of his more Marxist period, however, especially his Goethe-entry for the *Great Soviet Encyclopedia*, seem to fully return to Schiller's and Heine's judgement and to depict Goethe's scientific attempts as no more than a subterfuge. For elucidating accounts concerning the Walter Benjamin – Goethe relation, see: GAGNEBIN, J.-M., Les bois, les cendres, la flamme: de la critique chez Walter Benjamin, **Les cahiers de l'Herne**, v. 104, Paris: Éditions de l'Herne, 2013, pp. 186-191; BERDET, M., **Walter Benjamin, la passion dialectique**, Paris: Armand Colin, 2014. (Unless indicated otherwise, all translations are of our own making.)

[4] Cf. for example HUSSERL, E., **Cartesianische Meditationen**, Hamburg: Felix Meiner, 1995, p. 58: "In its widest sense, evidence designates a general *Urphänomen* of intentional life (…)".

tically absent. Karl Löwith, however, a rare exception, attributes to Goethe in his highly influential *Von Hegel zu Nietzsche* (1939) a very important role, precisely due to his concept of history, in opposition to Hegel's, namely as *the* alternative to a supposed left-Hegelian historical determinism (eschatology).[5] According to Löwith, this alternative was then accessed by Nietzsche and later may have become influential to both Husserl's and Heidegger's concepts of phenomenology.

However, with both anthroposophical and Nazi abuse of Goethe's image and of themes emanating from the many forms of *Lebensphilosophie*, Goethe's presence in philosophical and scientific debates became all the more problematic, if not entirely falsified. In this context, it is interesting to observe how, in spite of that, two great inspirators of the sexual revolution of the 1960s and 70s, Wilhelm Reich and Herbert Marcuse, held distinctively Goethean views with regards to the elements for a new scientific perspective on life. Reich, for instance, defines the vital process [*Lebensprozeß*] as a "constant alternation of expansion and contraction", a perfectly Goethean image.[6] With regards to Marcuse, when Habermas criticized his speculation concerning an alternative direction to the progress of science, he claimed that such a project had to do with the idea of a

> resurrection of the fallen nature: a *topos* that, as is generally known, penetrated Schelling's and Baader's Philosophy through the Swabian pietism, returns in Marx's *Pariser Manuskripte*, today determines the central thought of the Blochian Philosophy, and, in a reflected form, also guides the more secret hopes of Benjamin, Horkheimer, and Adorno.[7]

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[5] Cf. LÖWITH, K., **Von Hegel zu Nietzsche: Der revolutionäre Bruch im Denken des 19. Jahrhunderts**, Hamburg: Felix Meiner, 1995, pp. 20-43. The interest of such a thesis is that Goethe may thus escape from the criticism – certainly applicable to Herder and Hegel, for instance – that he offers a solely teleological idea of the transformation of species. In fact, just like Goethe's anti-eschatological concept of history one may find in his natural observations an anti-teleological consideration of transformation: infinite metamorphosis, guided by a certain structure (*Urtier*, *Urpflanze*), but nonetheless inexhaustible in its possible variations. This innovation by Löwith may be partially rooted in CASSIRER, E., **Goethe und die geschichtliche Welt** [1932], Hamburg: Felix Meiner, 1995, where the neokantian had already advocated for the soundness of Goethe's vision of history and nature. But Cassirer's attempt is mainly directed at bringing together, via Schiller, some Goethean and Kantian positions, and that with the intention of making the latter seem less outdated. However, after detailed research into the context at hand, this dislocation of Goethe from his proximity to Herder to that of Kant finds no justification.

[6] REICH, W, **Die Entdeckung des Orgons I, Die Funktion des Orgasmus. Sexualökonomische Grundprobleme der biologischen Energie**, Köln: Kiepenheuer & Witsch, 1969, p. 217. Cf. the whole chapter on the "biological foundations" of his theory of sexuality (ibid., p. 188 ss.). Like Reich, Freud's psychoanalytical theory is deeply embedded with Goethean motifs. Although the influence of Nietzsche (and Schopenhauer) is usually much more emphasized, Goethe is still the most frequently quoted author in Freud's works, losing only to the Bible in number of references.

[7] HABERMAS, J., **Technik und Wissenschaft als „Ideologie"**, Frankfurt a.M.: Suhrkamp, 1969, p. 54.

Goethe is not even mentioned. But his presence in this question is certainly undeniable, and much less marginal than that of Baader, for instance. The fact that Habermas "forgot" to mention Goethe in this context, and precisely in a book whose title is "Technology and Science as 'Ideology'", seems very significant to us.

After this broad panorama, it seems safe to draw the following conclusion: central figures of German philosophy since the early 19th century (Schelling, Hegel, Schopenhauer, Marx, Nietzsche, Husserl, Cassirer, Bloch, Heidegger, Benjamin, Löwith, Adorno, and Marcuse – as well as Freud and Reich) were all somehow influenced by Goethe's scientific project, but this influence had to become gradually more veiled, precisely as the positivistic view of science accomplished its colonization of the epistemic scenario. It was however only in the late 1970's – also on the track of the ecological perspective inaugurated by Hans Jonas (who, notwithstanding, due to his polemics against Bloch, didn't have much affinity with Goethe), and together with the rediscovery of Schelling's and Hegel's philosophies of nature – that historians of both science and philosophy acquired renewed access to Goethe's scientific project.[8] And from this renewed access one is therefore able to pose the question: is it not only urgent today to re-evaluate Goethe's role in science and philosophy?

We shall attempt to introduce this task by considering the three key moments or images of Goethe's scientific project: *Urtier*, *Urpflanze* and *Urphänomen*, in an attempt to show their inner coherence, as well as their properly scientific and philosophical value.

2. Urtier

To grasp the potentiality of Goethe's scientific efforts, it is paramount to understand that it is by no means simply a denial of the then hegemonic analytic procedures (e.g. in Linnaeus) in favour of a synthetic, idealistic speculation concerning the unity of nature. Because for Goethe the investigation of a specific scientific theme could never be separated from the research into its history[9], he soon was able to perceive that each one of these two diverging

[8] Cf. WELLS, G., Goethe and the development of science 1750-1900, Alphen aan den Rijn: Sijthoff & Nordhoff, 1978; ADLER, J., „Eine fast magische Anziehungskraft". Goethes „Wahlverwandtschaften" und die Chemie seiner Zeit, Munich: C. H. Beck, 1987; MOLDER, M. F., O Pensamento Morfológico de Goethe, Lisbon: Imprensa Nacional – Casa da Moeda, 1995; LACOSTE, J., Goethe – Science et philosophie, Paris: PUF, 1997.

[9] Cf. GOETHE, J. W., Zur Farbenlehre, Vorwort, in: **Gedenkausgabe der Werke, Briefe und Gespräche in 24 Bänden und 3 Ergänzungsbänden**, herausgegeben von Ernst Beutler, Zürich: Artemis, 1948–1971 – henceforward cited as **ZA** – vol. 16, p. 13: "(…) that the history of science is science itself".

tendencies – analysis and synthesis – was in itself incomplete: analytic procedure, if left to itself, led to a shallow form of empiricism, incapable of grasping nature's becoming; on the other hand, mere synthesis led to a shallow form of speculation, exterior to nature's concreteness, and ultimately to a hardly scientific mystification of nature. Therefore, Goethe's great discovery was a means to reach out into a higher, mediated unity between these two extremes, which forms, at once, the epistemological consequence and the methodical basis of his vision of nature as a constant movement of expansion and contraction. As he says in a significant fragment entitled *Analysis und Synthesis*, "only the two together, just as in- and exhaling, constitute the life of science".[10] The great dispute which broke out in the French Academy of Sciences in 1830 between Geoffroy Saint-Hilaire, the analogy-seeker, and Cuvier, the radical analyst with a solid background in Kant's third *Critique*[11], was critically elucidated by Goethe in one of the latest texts published in his lifetime.[12] Here we find that, in his view, both parties still lacked what he and the Jena circle had already possessed as early as 1784. This higher unity between analytic and synthetic practice – a *productive imagination* by many still condemned as originating from a metaphysical or idealistic approach to science[13] – became responsible for what could be seen as the correspondent of the French Revolution in terms of scientific worldview, that is, the inauguration of the morphological view of nature, which allowed to consider change and transformation as an essential constituent of each of its categories.

Goethe's discovery of the *os intermaxillare* (abbreviated to *Zwischenknochen* in German) in the human skull, out of whose inexistence eminent anatomists of the time intended to

[10] GOETHE, **ZA**, 16, p. 889.
[11] Cf. CASSIRER, E.,, Die Idee der Metamorphose und die „idealistische Morphologie", in: **Gesammelte Werke**, vol. 5, Hamburg: Felix Meiner, 2000, p. 149.
[12] Published in Hegel's Jahrbücher für wissenschaftliche Kritik in 1830 under the title Principes de philosophie zoologique discutés en mars 1830 au sein de l'Académie royale des sciences par Mr. Geoffroy de Saint-Hilaire. Paris 1830 (see GOETHE, J. W., **Goethes Werke**, Hamburger Ausgabe in 14 Bänden, mit Kommentar und Registern, herausgegeben von Erich Trunz. Christian Wegner Verlag, Hamburg: 1948–1960 – henceforward cited as **HA** – vol. 13, pp.219-250)
[13] This procedure acquired due concept in Schelling's *System des transzendentalen Idealismus*, as the last epoch of the absolute synthesis contained in the self-consciousness of the I. In a later annotation entitled *Anschauende Urteilskraft* (GOETHE, **ZA**, 16, p. 877 s.), Goethe 'identifies' it with the Kantian concept of an "intuitive faculty of judgement" – that is, Goethe, by influence of Schiller, uses this Kantian conception, which became so popular after Kant's third *Critique* and Schelling's glorification of it, to illustrate for philosophers his practical intuition derived from empirical work. One must have in mind that those were the years in Jena of an attempted – but in the end ill-succeeded – reconciliation between the Kantian and Herderian perspectives (e.g. Fichte, W. von Humboldt, Fr. Schlegel). Goethe, who didn't have a sense for strictly philosophical research, could then use Kantian conceptualization as a means to illustrate his scientific approach for philosophers, but the inadequacies of such an illustration will become clear as the project of the *Farbenlehre* unfolds.

prove the radical separation between human beings and higher primates (and, consequently, between humans and all other mammals), was his first significant contribution to the field of natural science. It provides us with a fairly straightforward model for grasping his morphological procedures in opposition to the solely analytical methods of anatomy (as practised by Camper und Cuvier, for example). In fact, the bone in question cannot be found through mere anatomic dissection of a fully developed human skull. To answer the question as to where it had disappeared to, Goethe engaged in the comparative analysis not of two or more specimens, but of the whole *development* of each one of them, from the embryonic state on. In this way, it became quite easy to see how humans did possess this bone, and that it was absorbed into the maxillary structure only at a later stage of the skull's development. Thus, it was the *empirical* research into the history of an absence, that is, the consideration of *movement* and *change* as an essential element of the living organism*, and not a merely idealistic speculation*, which led Goethe to deliver this radical proof of the connection between humans and other mammals. Therefore, Goethe's research into the structure of what he would later call the *Urtier*, that is, of the idea of animal in its infinite metamorphoses, is no purely speculative business; it is not the unity of the idea that is at stake, but the patterns that arise from the observation of empirical mutability. One could say that, if Galileo was the first to see the craters of the moon, Goethe was the first to *see* the transformation of species, and, consequently, that "man is most intimately akin to animals" (*aufs nächste mit den Tieren verwandt*).[14]

This difference is fundamental to understanding what characterizes Goethe's *morphology* in opposition to *anatomy*. While 'anatomy' (from the Greek ἀνα + τομία – literally 'cutting up') is practically a synonym of 'analysis' (ἀνα + λύειν – *Auflösung* in German, that is 'loosening up', 'dissolution'), 'morphology' (the 'science of' or 'discourse on forms'), a title introduced by Goethe into science to characterize the nature of his research, is anything but a purely analytical procedure. On the contrary, it implies simultaneously a consideration of the continuous change of organisms and of species as a whole. This change, in turn, was called by Goethe the *metamorphosis* of these organisms and species, that is, their 'trans-formation' (μετα-

[14] Letter to Knebel 11/17/1784: "I have refrained [in the dissertation about the *os intermaxillare*] to allow the result to which already Herder points in his Ideas to be perceived, that is, that the difference between human beings and animals cannot be found in any one thing. Rather, the human being is most intimately akin to animals." (GOETHE, **ZA**, 17, p. 21; p. 800 s.)

μόρφωσις), the continual transcendence of their own form in the process of organic development. In this way, one could say that Goethe, by calling his science morphology – in radical opposition to monadology, for example –, intended to overcome the separation between anatomy, the analytic study of organic structures, and physiology, the etiological study of organic functions. This separation, which allowed to reduce all *change* to mere *motion* of fixed parts and elements, provided the grounds for a mechanistic view on life-processes that Goethe considered highly detrimental to the true understanding of nature, especially of living organisms.

To understand the radicalism of this new procedure proposed by Goethe, one must consider that his discovery of the *os intermaxillare* dates from 1784 (over seven decades prior to the first appearance of Darwin's *On the Origin of Species*, in 1859), precisely the publication year of Herder's *Ideen zur Philosophie der Geschichte der Menschheit*, and was seen by Goethe himself as a contribution to Herder's new radical conception of History.[15] It is important to note that Kant himself reviewed Herder's book right after its publication, and was quite shocked to find in it a defence of the idea of an "affinity between the genera and species", whereby "either one species would come from another and all of them from a singular original genus, or maybe from a singular generating mother-womb" – a terrible scandal that "would lead to ideas which are however so gigantic that reason trembles and shakes before them".[16] One of the ideas which Kant makes it a special case to scorn (cf. op. cit. p. 801) is especially highlighted by Herder, namely the dissolution of the right to differentiate humans into biological races, since their exterior differences were seen by Herder as no more than historical and passing accommodations to weather, geography and, last but not least, culture. Kant, trapped in the strict dichotomy between analytic and synthetic knowledge of the *Critique of Pure Reason*, feared that, without the analytic category of race, science would be deprived of a conceptual basis for establishing any kind of knowledge about the human being as a species. – Thus, one finds in the little town of Weimar, just a few years before the outbreak of the Revolution in Paris, an empirically based theory of evolution directed at undermining racism within biology and anthropology, and the

[15] In a letter to Herder, dated March 27th 1784, Goethe writes: "I have found – not gold or silver, but something that pleases me beyond words – the *os intermaxillare* in the human being! Together with Lodern, I compared human and animal skulls, got on to the track of it and lo, there it was. I only ask you not to let it show, for it must be treated in secret. It should also please you heartily, for it is like the keystone of humanity, it isn't missing, but it is also there! But how! I also thought of it in connection with your whole, how beautiful it will be there" (GOETHE, **HA**, 13, p. 594).

[16] KANT, I.,, "Rezension zu Johann Gottfried Herders Ideen", in: idem, **Werkausgabe** B. XII, Frankfurt a. M.: Suhrkamp, 1964, p. 792.

empirical proof of the continuous connection between humans and the other mammals and animals in general. These achievements allow us to understand more concretely the terms of the lasting radicality emanating from the *Sturm und Drang* movement.

Having considered this, it is not so striking that, when Goethe sent his discovery to the most eminent comparative anatomist of the time, Peter Camper, precisely the one who was the fiercest in defending the radical separation between humans and the other mammals, he did no more than simply ignore Goethe's proof,[17] because, indeed, the insight into it demanded a certain flexibility of imagination with which the analysts of the time could not afford to experiment. It demanded, in fact, a faculty of intuition liberated from the ossification of old dogmas, and courage to face the not only scientific, but also social consequences of such a discovery.

3. Urpflanze

The notion that all living forms may have somehow a common origin (*syngeneia*), or some sort of reciprocal affinity (*sympatheia*), roots back to Plato's Timaios, where we already find the narrative of the construction of the world as an organic totality whose constituting parts had to relate to one another as parts of a single organism. This idea was carried forth in the neoplatonic tradition, especially by Plotinus, acquired strength during the Renaissance, was heavily criticized by Descartes, later adopted by Spinoza, who paid a bitter price for defending it, until it found a more acceptable form (to the modern taste) in Leibniz's monadological explanation of the gradual composition of substances and notions, that is, in the theory of pre-

[17] Cf. GOETHE, **HA**, 13, pp. 236-237, 594.

established harmony.[18] Through the mediation of Jewish late medieval mysticism, the Kabbala,[19] these neoplatonic ideas came to be connected with the project of a complete Encyclopaedia of nature and human knowledge, such that each and every term within it could be organized by the order of sufficient reason: the simple and most general notions and substances first, the more specific and complex thereupon. But, since Leibniz himself still operated, even if with shocking liberality, within the common dichotomy of analysis and synthesis, such a gradual synthetic construction of the totality of knowledge depended upon the completion of the analysis of the entire horizon of notions and substances – the well-known idea of a *characteristica universalis*. Analysis and synthesis, although somehow in a reciprocal relation, were still conceived here as the two sides of one coin – analysis –, not yet as the in- and exhaling methodology proposed by Goethe.

Since Leibniz never accomplished his *characteristica*, the great encyclopaedists of the 18th century, Diderot, D'Alembert, and, in the field of natural history, Buffon, had no alternative but to abdicate from the original ideal of a complete systematic and continuously ordered Encyclopaedia, and thus arranged the themes either simply in alphabetical order (which implies absolute arbitrariness in terms of organization) or disposed more or less in accordance with great thematic fields.[20] Buffon, in turn, still tried to search for a "primitive and general design – that one could follow extensively – upon which everything seems to have been conceived".[21] Linnaeus, on the other side of the spectrum, and quite in touch with Leibniz's original idea, proposed with immense success the *natural characteristic*, whereby the species and genera of

[18] "In Plotinus' philosophy (ca. 205-270), 'sympathy' reached its next great development, occupying a central position. Plotinus used 'sympathy', but also other words such as 'symphonia', 'harmonia', and 'analogia'. For Plato, the world produced from the 'One' is unified by means of 'sympathies'. These reach from the 'Idea' through different levels down to matter and produce the unity of the universe. As it is said in the *Enneade*, V, 4, 36, for example: 'The universe [is] a sigle living being which contains all living beings that exist within it;' this 'unity of all' (*Alleinheit*) is in a 'community of action' (*Wirkungsgemeinschaft*) or 'sympathy'" (ADLER, **„Eine fast magische Anziehungskraft"**, p. 39) And further: "The development of the thought of 'sympathy in the 16th century had an enormous repercussion. On one hand, it provoked the fiercest oposition in rationalism, notably in Descartes' thought, and penetrated, in a different form, modern physics and chemistry. On the other hand, it led over to the hermeticism of the 18th century, to romanticist philosophy and to symbolism. These two opposite movements meet in Goethe's *Wahlverwandtschaften*." (idem, p. 40)

[19] SCHOLEM, G., Die jüdische Mystik in ihren Hauptströmungen, Suhrkamp, Frankfurt a.M., 2015; ROSSI, P., Clavis universalis: arti mnemoniche e logica combinatoria da Lullo a Leibniz, Milan: Riccardo Riccardi Editore, 1960, p. 101 s.

[20] Cf. on this topic WEIGEL, S.,, Genea-Logik, Generation, Tradition und Evolution zwischen Kultur- und Naturwissenschaften, Munich: Wilhelm Fink, 2006, p. 37 ss.

[21] "(…) dessin primitif et général – qu'on peut suivre très loin – sur lequel tout semble avoir été conçu". *Histoire Générelle*, IV, p. 379, apud GOETHE, **HA**, 13, p. 247 (*Principes de Philosophie Zoologique*).

the plant kingdom were systematically ordered according to the number of their sexual parts. Thus, however artificial, a systematic and encyclopedic ordering of nature came effectively to light, and with it a new systematic nomenclature.[22] Rousseau, however, feared that two centuries of modern botanical libraries were in danger of becoming completely useless due to Linnaeus's new and so successfully applied *natural algebra*. He thus set himself the task of writing a dictionary, along with several pedagogical letters, aiming at bridging the new and the old order of things, and also at educating the mind to a more organic exchange with nature.[23]

Goethe's *Metamorphosis of Plants*, published in 1790, sharing Rousseau's humanistic efforts against the colonization of natural thinking and observation by the success of Linnaeus's so-called applied algebra, contained his first attempt at a more ambitious application of the methodology he had been developing since his earlier contributions to comparative anatomy and osteology. While his works on the animal kingdom were carefully limited to specific questions, in the *Metamorphosis* he is ready to take a daring step and deliver a schema applicable to the plant kingdom as a whole: a botanical dictionary, but one that was, so to speak, truly *alive*, that is, that strived to follow the real and observable natural deployment of the categories of the idea of plant, the *Urpflanze*. It not only presents all the organs that compose a plant in their natural order, but shows how they in fact are not 'parts' of the plant (as a mere analysis would suggest), but all just more or less artificially isolated 'stations' in the living movement of that plant as a whole; that, further, the plant itself – or rather the *idea* of plant – *is* this movement, produced by one basic principle, which consists in the alternate expansion and contraction of a same, equally basic form: the leaf, modified by the specific conditions each plant found itself in. In this way, through this eminently *narrative* form, both elements, the analytic and the synthetic, are presented harmonically, the former as the 'stations' of the plant's metamorphosis,

[22] Linnaeus successfully organized the plant species and genera according to the 'universal' characteristic of the number of sexual parts, and developed a systematic nomenclature that reflected the Leibnizian precepts, which essentially connected Encyclopaedia and *characteristica*. He states in his *Genera plantarum*, § 18: "I deliver, thus, the *natural characteristics*, which exhibit almost all attributes to be found in the parts of flowers and are common to all species; as far as I know, no one has handled them in this way before me" (LINNAEI, C., **Genera plantarum**, Leiden, 1737); and in *Fundamenta botanica*, VI: "The natural characteristic shall contain all the different and peculiar attributes of the fructification that coincide in each and every one of their species, and shall omit the divergent ones" (LINNAEI, C., **Fundamenta Botanica**, Amsterdam, 1736). In turn, the natural differences to be used for the specific nomenclature "are to be founded necessarily in the *number, figure, proportion,* and *position* of the various parts of the plant" (idem, VIII). Linnaeus's project was later refuted by Jussieu, who proposed the substitution of the artificial order by a natural one, seeking in the number of cotyledons the criterion for the retracing the true history of nature.

[23] See ROUSSEAU, J.-J., **La botanique de Rousseau**, Paris: F. Louis, 1802.

and the latter as this metamorphosis itself, the ceaseless movement that the plant, if taken as a whole, *is*.

Thus, if Leibniz attempted to modernize via algebra the neoplatonic view of the harmonic unity of nature as a whole, Goethe achieved, via careful and cultivated empirical observation, to liberate himself from the neoplatonic view, both from its original metaphysical and its modern algebraic elaborations.[24] Goethe called the bond that tied the overwhelming multiplicity of nature into a higher unity a "law", but also a "type" or an "idea"; it was neither an apodictic, mechanistic, mathematically expressible rule, nor a mere static model (as it is for Kant and Cuvier), but rather a *dynamic fundamental schema*, which allowed the freedom for innumerable modifications within its fundamental structure – much like a musical theme, that can be freely elaborated in countless variations. In this sense, it can be said that the general Platonic principle of a universal "plan" underlying each genus was counterbalanced by the rather Aristotelian notion that this principle, however universal, always manifested itself in the particular phenomena, as the result of the dialectics of an inner law exposed to particular external conditions.[25] Still, Goethe goes one step further from Plato, Aristoteles and Leibniz as he ceases to view the many genera as eternal pre-established forms.

An illustration may be helpful here: whereas Leibniz defended the notion of preformation (later developed by Linnaeus), which implied that the "masculine" seed (e.g. pollen) was solely responsible for carrying within itself the form to be later reproduced in eternal, albeit accidentally variable, repetition, the feminine parts having no more than the function of a *receptaculum*; Goethe, on the other hand, empirically ascertained the material and formal affinity between the "masculine" and "feminine" parts of the plant, and also that reproduction or conception should be explained as an *anastomosis*, that is, the *a posteriori* synthetical combination of the matters produced by "masculine" and "feminine" forms.[26] The identity of a certain plant or animal individuum derives, for Goethe, therefore, not from a previous established identity (Leibniz' monad), but rather from a previous diversity then synthetized. For Goethe, thus, in a prefiguration of the dialectical method later developed by Hegel, two is the sufficient reason of one, and not the other way around, as Leibniz would have it, as implied by his defence of the

[24] Goethe explicitly states the detrimental effects of metaphysical, mathematical, mechanical, and even moral formulations for scientific knowledge in *Zur Farbenlehre*, § 752 (GOETHE, **ZA**, 13, p. 203 s.).
[25] See GOETHE, **ZA**, 17, p. 792 s.
[26] Compare §§ 72-75 of Leibniz' *Monadology* with § 69 of Goethe's *Metamorphosis of Plants.*

notion that the monad is the sufficient reason of multiplicity. Without the monadological, that is, analytical, foundation, there could be no preestablished boundaries and limits to transformation – therefore, absolutely no obstacle for the affinity of humans and other animals. By destroying Leibniz' and Linneaus' analytical foundation, Goethe also places himself in radical opposition to the doctrine Kant presented in his *Critique of judgement*; and this opposition was not at all diminished when Goethe himself later came to learn, via Schiller, how to operate within the new Kantian terminology.

4. Urphänomen

In a sense, *Zur Farbenlehre*[27] (1810) can be seen as the apex and ultimate generalization of Goethe's new approach to science, which also contains a general exposition of his procedures in scientific experimentation. Therefore, if the *Metamorphosis of Plants* consisted in the complete narrative account of the *Urpflanze*, this later work aims at exposing how such a global account was indeed scientifically possible at all, that is, how it is that, in general, departing from the many specific phenomena and their moments, one is able to reach the *Urphänomen*, in short, how any isolated *experience* [*Erfahrung*] can become a scientific *experiment* [*Versuch*] *strictu sensu*.

This fundamental experimental approach of Goethe's scientific project finds a more succinct expression in a short private writing entitled *Der Versuch als Vermittler zwischen Objekt und Subjekt* (1792), composed with the intention of explaining to certain "friends" the goal of his many "optical efforts".[28] Here Goethe states that "an experiment, even many experiments connected to each other do not prove a thing", for we all have the tendency to, in order to give a coherent appearance to our experience, consider that things are more closely related than they actually are; hence our inclination for building hypotheses and theories that allow us to connect the experiences and experiments, which, in themselves, are nothing but "an isolated part of our

[27] It should be noted that translating the title of this work to *Theory of Colours* seems to be in conflict with Goethe's anti-theoretical stance: the title *Zur Farbenlehre* refers first of all not to a *theory* of colours, but rather to a "doctrine" (*Lehre*); secondly, the preposition "*zur*" denotes that Goethe did not intend to deliver this doctrine as such, but to write "on" it, to work "toward" it – which does not even imply that this "doctrine of colours" is at all achievable, let alone that it has already been completed.

[28] GOETHE, **ZA**, 16, p. 854. It is quite clear that the "friends" mentioned here are specifically one friend, namely the Kantian Schiller, who repeatedly tried to dissuade Goethe from the project of the *Farbenlehre*.

knowledge".[29] According to Goethe, instead of providing proof to theory, the scientific experiment should serve, as clearly stated in the title, as a *mediator* between the profuse variety of experience and the natural organizing tendency of the cognitive subject, by turning each moment of the former into a well-determined, reproducible event.[30] Once the isolated experiences have been transformed into these so-called "pieces of knowledge", it is the scientist's task to carefully arrange them in such a way that their *natural order*, their experimental narrative, becomes tangible in itself, without the aid of any further theoretical and rhetorical constructs, such as mathematical theorems, for instance. This natural order of experimentation is, in itself, the idea, the "pure phenomenon", beyond which it is futile, even dangerous to go.[31] Therefore, it is neither the object in its blunt aposteriority, nor the subject with its apriori transcendental conditions (forms of sensibility, concepts and ideas) who dictates the path. The experimentation mediates both extremes, whereby one is able to avoid both a shallow empiricism and the attempt to imprison the phenomenal horizon within the strict bounds of analytical mathematization.

Thus, the peculiarity of Goethe's method in opposition to mere analysis comes to light in the *Farbenlehre*, just like it had in the contrast between morphology and anatomy. This time, the analytical standpoint is represented by the Newtonian theory of colours. Newton's starting point is the hypothesis that light in itself is white and that colours are simply the product of its geometric analysis, empirically manifested through its refraction in a prism. Goethe's phenomenalism, on the contrary, does not presume the existence of an ideally pure white light (Newton assumed wrongly that sunlight is purely white, and, thus, that pure white light should be empirically given). In fact, there is no such thing as a pure colour at all in real experience, but only an incessant play of hues and shades.[32] It is possible, through certain artificial conditions as

[29] GOETHE, **ZA**, 16, p. 849 s.

[30] "If we repeat intentionally the experiences [*Efahrungen*] made by us (…) and present again the phenomena that had been produced partly by chance, partly by artifice, we call this an experiment [*Versuch*]." (GOETHE, **ZA**, 16, p. 848)

[31] "Thus, what we would have to produce through our work, is: / 1. The empirical phenomenon, / of which everyone is aware in nature, which, later, / 2. Is elevated into a scientific phenomenon / by means of experiments, by presenting it in other circumstances and conditions than it had become known in the first place, and in a more or less felicitous sequence. / 3. Finally, the pure phenomenon / appears as a result of all experiences and experiments. It can never be isolated, but shows itself in a constant sequence of phenomena [*Erscheinungen*]. In order to present it, the human spirit arranges what is empirically unstable [*wankend*], eliminates contingency, separates impurities, develops what is nebulous, yes, discovers what is unknown." ("Erfahrung und Wissenschaft", GOETHE, **ZA**, 16, p. 871).

[32] "(…) until now light was saw as a type of *abstractum*, as an essence by itself subsistent and efficient, so to speak self-conditioning, producing the colours from itself at minor circumstances. But our goal is to deviate the friends of nature from this type of representation, to make them notice that by prismatic and other phenomena we are not dealing with an unlimited conditioned light, but with a limited conditioned light, with an image of light

those produced by Newton in his experiments, to slow down this play to such an extent as to render the change imperceptible, but the notion of a pure colour is in itself an abstraction obtained through an intellectual process of analysis. Hume's famous problem of the 'missing shade of blue' demonstrates the unsurmountable gap that always persists between the real phenomenon of colour and the abstraction of a pure colour. For Goethe, the phenomenon of colour 'in itself', i.e. as a whole and as a unity, lies not in an original ideal synthetical unity, but in the dynamic process itself through which actual colours *transform* into one another. Just as in the case of the metamorphosis of plants, colour *is* this movement, of which the specific colours are just 'stations', real insofar as they are abstracted from the actual phenomenon of colour transformation, but ideal insofar as they are abstractions that do not, as such, have an existence outside the movement of colour transformation. Unlike the prismatic colour-spectrum projected on the wall in the basic Newtonian experiment, Goethe's colour-wheel is not static, but rather the representation of the *movement* that colours make in their transformations into one another. Consequently, instead of conceiving the phenomenon of colour as an original unity, to be analysed and projected as a static spectrum, Goethe constructs it as a process of succeeding analyses and syntheses, guided by two principles that can be considered as a more universal formulation of those of expansion and contraction leading to ever higher forms that Goethe presented in his *Metamorphosis*: *Polarität und Steigerung*. Together, they build the *Urphänomen*, that is, the dynamic process of transformation that is the phenomenon of colour. Like Newton's white light, Goethe's *Urphänomen* is the global phenomenon of colour, from which each singular colour is extracted through analysis. But instead of considering it as an original synthetic unity, Goethe conceives the *Urphänomen* as a movement of analysis (*Polarität*) and synthesis (*Steigerung*)[33], which contains both the individual colours (the various 'stations' of that movement,

(*Lichtbilde*), yes, with images in general, clear or dark. This is the task whose resolution we would like to achieve." (*Zur Farbenlehre* §361, GOETHE, **ZA**, 16, p. 115-6) Colours are therefore limited conditioned light, light as a concrete phenomenon: "From here on everything falls more and more under higher rules und laws, which, however, do not revelate themselves to the understanding through words and hypotheses, but rather to the intuition through phenomena. We call them *Urphänomene*, because there is nothing in the world of appearances that be higher than them, and they, in contrast, make it possible that one could, step by step, just as we before elevated ourselves, now descend from them downwards until the most common occurrence in the everyday experience. One such *Urphänomen* is that which we have already presented. We see at one side light, the clear, at another darkness, the dark, we bring turbidity (*die Trübe*) between both, and out of these oppositions, with the help of thought-out mediation, the colours develop themselves, **also in an oposition**, nonetheless they point out once again, through reciprocal reference, immediately to something common." (*Zur Farbenlehre* §175., GOETHE, **ZA**, 16, p. 69)

[33] "What enters in the world of appearances must divide (*trennen*) itself, only to appear. The divided searches for itself again, and it can find itself and unite itself; in a lesser sense, inasmuch as it mixes itself only with its opposite,

of which the turning points of the curves constitute privileged moments) and the passage between them (the movement itself taken as movement, that is, as a synthetic unity).

The first of these principles, that of polarity, situates the phenomenon of colour between two abstract poles: light and darkness. As such, these do not occur in experience; instead, they represent the ideal outer boundaries within which the movement of colour transformation occurs. The principle of polarity states: contrast between colours is not only real, but the very tension underlying all individual phenomena of colour, the principle behind the movement that leads from one colour to another. This contrast would indeed be absolute – and we would then have real light and darkness, but *only pure* light and darkness – if there weren't always a *medium* in which it manifests. This mediation (second principle, *Steigerung*), in turn, is operated by the interposition of an ever denser medium, causing the elevation of black and white into blue and yellow, from there on into reddish-blue and bluish-red on one side, and yellowish-red and reddish-yellow on the other, and finally to the full red colour [*Purpur*] that represents the highest intensification of colour; on another path, the physical mixture of blue and yellow leads to green through the corresponding stages of greenish blue and yellow, and bluish and yellowish green respectively.[34]

But polarity does not only dominate the relation between light and dark and all the colours; the eye, too, is in a polar relation to this process as a whole, so that Goethe's narrative of colour-constitution is in fact the account of experience as such. In the *Farbenlehre*, we meet a Goethe that has finally found the ultimate guiding principle of nature, that is, of experience. Wherever he looked, Goethe saw duality striving towards unity and unity, in turn, striving towards duality.[35]

as it assembles with its opposite, then the appearance becomes zero or at least indifferent. But the unification can also occur in a higher sense, inasmuch as the divided first elevates (*steigert*) itself and through the synthesis (*Verbindung*) of the elevated sides produces a third, something new, higher, unexpected." (*Polarität*, GOETHE, **ZA,** 16, p. 864).

[34] The use of these specific terms (yellowish-red / reddish-yellow and blueish-red / reddish-blue instead of the more traditional 'orange', 'violet' etc.) reinforces the notion that these colours are all just 'stations' in the constant game of light and shadow which for Goethe is the actual 'idea' behind all colour phenomena. About this mode of terminological construction see *Zur Farbenlehre*, §§751-757 (GOETHE, **ZA**, 16, p. 203 ss.).

[35] Cf. *Zur Farbenlehre*, §739 (GOETHE, **ZA**, 16, p. 199): "that everything which should appear, which we should encounter as a phenomenon, would have to point either to an original divisiveness capable of unification or to an original unity able to reach a division, and present itself in such a manner. To divide what unified, to unify what is divided, is the life of nature". About this general concept of polarity (and elevation) in nature, cf. the fragment *Polarität* (1805), where Goethe also provides us with a list of natural polarities (GOETHE, **ZA**, 16, p. 863 s.); for the principle of polarity applied to colours cf. *Zur Farbenlehre*, §696 (GOETHE, **ZA**, 16, p. 188).

This phenomenological approach to scientific thought makes a comparison between his *Farbenlehre* and Kant's *Critique of Pure Reason* unavoidable: Kant posits the theoretical question about the transcendental conditions of synthetic judgments *a priori* and departs from the consideration of Lockean *primary qualities* (pure space and time), in order to prove the ground of Newton's success; in opposition to that, Goethe is concerned with synthetic judgements *a posteriori*, he departs from the consideration of *secondary quality* (colour) and attempts a complete refutation of Newton. Kant, like Newton, presupposes an original synthesis (the unanalysed manifold of perception; the original synthesis of apperception) which, when analysed through the categories of understanding, produces knowledge; for Goethe, on the other hand, what is original is neither analysis, nor synthesis, but a global dynamic phenomenon of which analysis and synthesis are the two directions in which it oscillates (*Polarität* and *Steigerung*). It is the same movement that presents itself synthetically as a dynamic principle and analytically as a curve composed of an infinity of 'stations'.

Concluding Remarks

The account of the *Urpflanze* given in the *Metamorphosis of plants* was already the generalization of the first insights into the *Urtier*; now we see how the doctrine of the *Urphänomen*, in turn, is the last possible generalization of what Goethe had achieved in the plant kingdom with the *Urpflanze*. Thus, just like Goethe's narrative of the *Urpflanze* was no theoretical construction, but rather just the careful organization of the experiments he had carried out in that field, his *Farbenlehre* is not a *theory* of experience – it simply *is* experience, organized. In whichever way we look at Goethe's scientific works, as soon as one grasps the coherence of his trajectory, it is undeniable that the experimental progression into higher forms of generalization that he carries out without ever leaving the phenomenal field denotes the work of an honest, diligent, and highly insightful scientific mind. To call this mere dilettantism denotes nothing more than ignorance, or spite.

In view of the proposed theme for the present volume of the *Revista Estudos Hegelianos*, we think it would be appropriate to end this paper by hinting at the many affinities between Goethe's scientific project and Hegel's speculative dialectics, all of which could perhaps be summed up in one single formula: *relation precedes – and transforms – that which is related*. For Hegel, too, *Sein* and *Nichts* are but immediate and abstract poles, stations or moments of

the infinitely unquiet concept of *Werden*, immanent synthesis of the former two – just as light and darkness are only analytical and abstract factors derived from the infinite process of colours becoming, an analogy proposed by Hegel repeatedly in the *Science of logic.* Hegel's *Begriff*, typified in the triad *Sein-Nichts-Werden*, would appear to be, thus, the philosophical version of Goethe's *leaf*, that is, a dynamical, ever-recurring and ever-transformed (logical) pattern that allows for the speculative-dialectical presentation of the nexus and sequence of the categories of pure thinking, which, by either Aristotle or Kant, were no more than artificially classified by means of their external characters. This possibility would illuminate the *Science of logic* as a "Metamorphosis of concepts". Furthermore, Goethe's conception of the reciprocal relation between analysis and synthesis seems so strikingly identical to what Hegel defended on the chapter *Die Idee des Erkennens* – the one directly prior to the *Science of logic's* last chapter, *Die absolute idee*, where we find the final formulation of what the speculative dialectical method is – that one is easyly seduced to regard Goethe, therefore, as the ingenuous inventor of modern dialectics. Ingenuous may be a harsh term, if one has the *Faust* in mind and its clear dialectical construction.[36] Anyhow, it may very well be the case that Hegel, in his progressive immanent critique of Kant and his ever growing and well documented admiration for Goethe, attempted to produce the very philosophy for which Goethe himself claimed to have no 'organ'. If he did attempt it – was he successful? Löwith, in his *From Hegel zu Nietzsche,* answered this question negatively. Notwithstanding his position, after the recent re-inauguration of serious historiographic and philosophical studies concerning Hegel's *Science of logic* and the Philosophy of Nature of Classical German Philosophy in general, it may well be time to evaluate if or how far his answer still holds. And by doing so, one may, at least, find new sources for the development of Hegel's philosophy, such that could finally overcome the never-receding ghost of Kroner's *From Kant to Hegel*. New sources that could inaugurate a conception of Hegel's philosophy that does not orbit around – or simply radicalize, without completely transforming – Kantian concepts.

[36] See LUKÁCS, G., **Goethe und seine Zeit**, Berlin: Aufbau, 1953, p. 9: "it is no coincidence that the regularity of the contradictory movement of development, the main principles of the dialectic method, become conscious precisely in Germany, in the period from Lessing until Heine, that Goethe and Hegel elevate this method – within the boundaries of bourgeois thought – to the highest possible level."

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