



## Humboldt, Darwin, and romantic resonance in science

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### ABSTRACT

There have been constant and multiple endeavours to argue for Darwin's both epistemic and practical debt to Romanticism. Almost all of these arguments emphasise Darwin's theoretical and aesthetic associations with Alexander von Humboldt, who, from a prevailing Darwin-centred perspective, is in turn usually oversimplified as an undisputed incarnation of Romanticism. The antagonistic view, however, develops nothing other than another stereotype of Humboldt as an anti-idealistic, pro-French, and even highly Anglophone empiricist naturalist, and accordingly rejects the claim of a romantic Darwin in terms of his Humboldtian inheritance. In this paper, I will first portray a balanced figure of Humboldt in terms of both his critical incorporation of romantic philosophy and the idiosyncratic history of his science. Then, I will thematically compare Darwin with Humboldt and other romantics so as to elucidate Darwin's peculiar appropriation of romantic tenets. Three interrelated romantic themes are examined, along with a discrimination of different senses in which the term romanticism is used: a) the literature-science relation, b) the pursuit of the unity in and through multiplicity, and c) the epistemic role of imagination. On the basis of this triadic dissection, both Humboldt's and Darwin's adherence to and departure from romanticism are reevaluated.

### 1. Introduction

The issue of whether and how much Darwin owed a debt to romanticism ceaselessly draws historical and philosophical attention from scholars. The issue is long-standing, for shortly after the publication of *On the Origin of Species* (1859), Ernst Haeckel had already indicated Darwin's theoretical associations with Kant and Goethe, the two German figures respectively regarded as one of “the true fathers” and a great mentor and comrade of romanticism.<sup>1</sup>

Scholars, such as Gillian Beer, George Levine, Michael Ruse, and Robert Richards, continually deepen and enrich related topics.<sup>2</sup> In the recent Richards-Ruse debate, this issue comes to a climax while at the same time surfacing the concomitant risk of misunderstanding.<sup>3</sup> The central concern is whether Darwin was significantly shaped by

romantically informed intellectual resources, or was decisively raised in a distinctive Victorian British milieu.<sup>4</sup> The antagonism appears profound, yet both sides unanimously presume some common problematic beliefs, one of which is the uncritical portrait of Alexander von Humboldt as an undisputed romantic associating Darwin with romantic philosophy. In this paper, I will first revise this presumption, the lack of sophistication of which weakens the ground of this extensive debate, and then expose Darwin's romantic take based on this revision.

One thing that complicates this issue is the fact that the concept of ‘romanticism’ itself is radically protean and opaque to defining formulations. It is precisely due to the ambiguity of this concept that related debates often fall into futile polemics. Richards provides a way out of this impasse by genealogically reconstructing the development of the constituent ideas of

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<sup>1</sup> In his letter to Darwin (10 August 1864), Haeckel argues that Darwin “through the epoch-making discovery of ‘Natural Selection’ and ‘Struggle for life’, for the first time provided the concrete proof for that abstract statement [of the theory of descent] *a priori* proclaimed by Kant and Goethe as “the only possible way of understanding the origin of species” (translations cited from Darwin Correspondence Project, “Letter no. 4586,” <https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-4586.xml>); Burkhardt et al., 1985–2015, Vol. 12, p. 299. Although Rupke emphasises that this Darwinian monism of Haeckel is not without socio-political interests, this paper will focus on the epistemic concerns of this association; Rupke, 2005. For Kant and Herder as “truth fathers” of romanticism, see Berlin, 2013, p. 127.

<sup>2</sup> Beer, 2009, 2010; Levine, 2008; Richards, 2002; Ruse, 2004; Richards&Ruse, 2016.

<sup>3</sup> Richards & Ruse, 2016.

<sup>4</sup> Other scholars offer more balanced narratives about Darwin's intellectual underpinnings. They remark a synthesis by Darwin between the romantic philosophy mingled with *Naturphilosophie* and Idealism and Victorian mechanical-empirical natural sciences. Moreover, this synthesis is precisely seen as Darwin's intellectual achievement and as the very condition of his theoretical construction of evolution by means of natural selection; see Greif, 2015; Sloan, 2003a; Lansley, 2018. My argument is along the same line, but in this paper, I intend to further revise Darwin's romantic bearing in this synthesis.

romanticism with a “biographical emphasis.”<sup>5</sup> However, the complexities of Humboldt are lost, to some extent unavoidably, in this inclination towards panorama, and the protagonist is merely appointed as the bridge between German romantic philosophy and Darwin.

Apart from the impossible definition and the ill-penetrated panorama, I adopt the same method as Nassar to illustrate romanticism yet with a specific biological concern, i.e., to thematically elaborate how early romantics and Darwin respond to the prevalent epistemic and theoretical issues relevant to science and organism.<sup>6</sup> Furthermore, any resort to antitheses employing big labels, such as that between German mystic and French rationalist and that between Enlightenment Vitalism and Romantic *Naturphilosophie*, is carefully handled, if not avoided.<sup>7</sup> For despite their insights, these antitheses build philosophical and discursive frontiers which the figures concerned here always straddle.

Therefore, in the second section, I will account for Humboldt's science in terms of both his critical incorporation of romantic philosophy and the historical evolution of this Humboldtian romanticism, thus eliminating the illusion of either a simply romantic or anti-romantic Humboldt. Then, in the third section, I will undertake thematic comparisons between Darwin and his romantic precursors. Three interrelated themes are examined, against which both Humboldt's and Darwin's adherence to and departure from romanticism are reevaluated: the literature-science relation, the pursuit of the unity in and through multiplicity, and the epistemic role of imagination. Concerning each theme, the primordial articulations of romanticism are distinguished from the more general, derived sense of this concept so as to reduce the vagueness that may otherwise obscure the theme. By this means, I will conclude that the radical primordality of romanticism was foreign to Darwin, but his reasoning was truly shaped by a romantic spirit fostered therefrom and sophisticatedly appropriated by him.

## 2. Humboldt's romantic science<sup>8</sup> and its idiosyncratic history

### 2.1. The critical incorporation of romanticism in Humboldt's science

In the first place, it can hardly be repudiated that Humboldt adopts fundamental romantic concepts and principles regarding proper natural inquiry. From an essentially romantic point of view, nature is conceived as an organic whole in the eternal process of metamorphosis. It is both the infinite, absolute productivity and the ordered multiplicity of products that embody [*einbilden*]—in their finitude, through their ceaseless formation, transformation, and reproduction—this infinite activity. Moreover, such a concept of nature is not only postulated as the *a priori* condition of the intelligibility of nature, but recognised as the necessary end of *a posteriori* empirical investigations. Humboldt endorses this twofold concept of nature as productivity and products. As he puts it, nature is at once “the totality of being and becoming [*Totalität des Seienden und Werden*],” “the inner moving force [*innere bewegende Kraft*],” and the “mysterious archetype of all appearances [*geheimnisvolle Urbild aller Erscheinungen*].”<sup>9</sup> It is “the moving vital activity of a universal world-force [*bewegende Lebenstätigkeit einer allgemeinen Weltkraft*].”<sup>10</sup>

Provided that this inner force [*Kraft*] and mysterious archetype [*Urbild*] can be grasped in reality through its objective manifestations, i.e., the manifold particular natural forces underlying appearances, Humboldt holds that the immediate aim of natural inquiry is to reveal general laws of the ordered actions and interactions of natural forces in and through all possible empirical phenomena. But this inquiring act does not terminate here. Rather, the ultimate end is held to be the elevation of human beings. The increase of synthetic knowledge and the cultivation of sensibility would elevate human beings to self-identification with nature and to self-consciousness as a free being and at home. As will become clearer later, this is a romantic enterprise.

Secondly, Humboldt also bases his science on the epistemological principle of idealist romanticism, that is, human knowing involves the necessary process of imposing mental form onto perceptible appearances alongside the reception of them. To use his own words:

The external world only exists for us so far as we receive it within ourselves, and as it shapes itself within us into the form of a contemplation of nature [...] as it were, without our being conscious of it, the external world and our ideas and feelings melt into each other [*so schmilzt, uns selbst gleichsam unbewußt, die Außenwelt mit dem innersten im Menschen, mit dem Gedanken und der Empfindung zusammen*]. ‘External phenomena are translated,’ as Hegel expresses it, in his Philosophy of History, ‘in our internal representation of them.’ The objective world, thought by us, reflected in us, is subjected to the unchanging, necessary, and all-conditioning forms of our intellectual being [*den ewigen, notwendigen, alles bedingenden Formen unserer geistigen Existenz unterworfen*]. The activity of the mind exerts itself on the elements furnished to it by the perceptions of senses.<sup>11</sup>

This then explains Humboldt's remarkable defence of the mind's constructive role in comprehending and presenting reality in the so-called ‘objective’ knowledge. Moreover, in the act of knowing, different human cognitive capacities, such as understanding and imagination, come into play no less as a unitary faculty than as separated representative powers: “the severe pursuit of exact knowledge, and the more delicate workings of the imagination, have tended to interpenetrate and blend each other” to form a living contemplation.<sup>12</sup>

The living contemplation as such marks the reciprocal participation between the subjective and the objective realms, i.e., the subjective configuration of the presentation of object and at the same time the re-fashioning of the subject's organs and faculties in this ‘presenting’.<sup>13</sup> It never ceases to animate this presenting-cultivating interplay between the subject and the object, and thus embraces a wide range of interconnected heterogeneous empiricities. For particular occasions can and should be created, in which subject and object reciprocally shape each other in as many different ways as possible. For Humboldt, as for other romantics, knowing is nothing but this self-entangled, reflexive, multi-judging event, and knowledge is the ordered record of rhapsodic instances of judgment. A synthetic unity not only of concepts but of feeling is to be inaugurated together with the full presence of living particularities.<sup>14</sup>

Humboldt's oeuvre demonstrates what form of knowledge finally arises from this contemplation: an organised whole of catalogued precise

<sup>5</sup> Richards, 2002, p. 5.

<sup>6</sup> Nassar, 2013.

<sup>7</sup> Ghiselin, 2015; Reill, 2005. In his insisting on an exclusively decisive British tradition, Ruse also belongs to this group; Ruse, 2004, 2016.

<sup>8</sup> For an excellent general introduction to romantic science, see Cunningham & Jardine, 1990.

<sup>9</sup> Humboldt, 1845, p. 83 (my translation). For more on Humboldt's concept of nature, see p. 22, where Humboldt cites Carl Gustav Carus, defining nature as the process of eternal growing, forming, and unfolding itself (“*das ewig Wachsende, ewig im Bilden und Entfalten Begriffene*”), and shortly after links this concept of nature to Goethe's metamorphosis, which Humboldt believes, just as Carus himself and his other contemporary romantics, sheds light on “the primordial secret of formation [*das Urgeheimnis aller Gestaltung*]” (my translation).

<sup>10</sup> Ibid., p. 52 (my translation).

<sup>11</sup> Humboldt, 1846, p. 64[70] (translations modified; I use [] to indicate the original page numbers of German editions of Humboldt's works if German texts are cited along with English translations).

<sup>12</sup> Humboldt, 1848, p. 4.

<sup>13</sup> In Goethe's words: “Every new object, well observed, opens a new organ in us [*Jeder neue Gegenstand, wohl beschaut, schließt ein neues Organ in uns auf*]”; Goethe, 1955, p. 38. In a more delicate manner than Humboldt, Goethe, together with Herder, develops a “tender,” “revisionary” romantic empiricism that confronts and cultivates the “bilateral metamorphosis” between subject and object. Identifying this “logic” in life itself, Goethe casts life as a tender condition, a “contingent susceptibility” to its milieu with which it con-forms rather than an “autonomous power.” He thus exhibits a romantic interest in the “tenderness [*Zartheit*]” divergent from the doctrine of teleological organicism and *Bildungstrieb* advocated by Kant and Schelling that offer merely an “insular ideal”; see Goldstein, 2014, 2017, pp. 22, 74, 130–135.

<sup>14</sup> Humboldt, 1846, pp. 99–101.

metrical data, multi-thematic isomaps, textual explications of laws and phenomena, animated depictions of natural physiognomies, and poetic narratives. This living, comprehensive, and aesthetically sensitive mind invites scholars to describe it as a “physiognomic eye,” meditative “gaze,” and “dizzying, integrating pirouette.”<sup>15</sup>

Humboldt's endorsement of this synthetic apprehending capacity, in which imagination plays as crucial a role as reason, is closely associated with his embrace of poetic language. At stake here is not a matter of the figure of discourse functioning posteriorly and ornamentally, but rather the proper way of bringing into appearance the reality encountered in its irreducible manifoldness, transience, and contingency, and of schematising it into tangible presence and audible utterance. For romantics, here lies an essential aspect of poetry and, on this ground, is manifested the essence of romanticism: romanticizing [*Romantisieren*] is nothing other than “a qualitative potentiation [*Potenzierung*]” that in correlation with a qualitative ‘logarithmicisation’ investigates “reciprocal raising and lowering [*Wechselerhöhung und Erniedrigung*]”<sup>16</sup>; more specifically, it is the “absolutisation-universalisation-classification” of individual moments, the absolute recurring and reassertion of these moments in their proceeding to the universal and differentiating consciousness marked by a concept or an idea.<sup>17</sup> One can now see why poetry is not only granted the aesthetic primacy but summoned by romantics to serve as the underpinning epistemic activity in human cognition and natural inquiry. In Goldstein's words, poetry as such is “intrinsic to any empirical knowledge of nature” and acts “as a privileged technique of empirical enquiry.”<sup>18</sup>

The idea of romantic poetry goes even further to offer the primary model and the ordering principle for the whole scientific enterprise. Friedrich Schlegel defines romantic poetry as “a universal, progressive poetry,” of which science is a substantial part and through which science is poeticised.<sup>19</sup> There would necessarily be a poetic science fusing poetry and science, feeling and truth into one. A transcendental dimension is also taken up that makes poetry responsible for its self-exposition. Then comes romantic poetry as “simultaneously poetry and poetry of poetry”<sup>20</sup> and accordingly the poetic science as both science and philosophy of science. It is in the same spirit that Novalis proclaims romanticisation as developing “a philosophical, a critical, a mathematical, a poetical, a chemical, a historical *Wissenschaftslehre*.”<sup>21</sup> In fact, the project of Novalis's *Das Allgemeine Brouillon: Materialien zur Enzyklopädistik* can be regarded as demonstrating this very process of poeticising.

In this regard, Humboldt is no exception. In his *Ideen zu einer Geographie der Pflanzen* (1807) dedicated to Goethe, the frontispiece depicts a scene in which Apollo, a god of poetry, unveils Diana, a god of nature. At the foot of Diana lies a half piece of slab inscribed with the title of Goethe's *Metamorphose der Pflanzen*. The depiction symbolises the common belief of Humboldt and Goethe in the capacity of poetry to reveal in nature what is concealed beneath the flux of appearances and untouched by a mechanical method. Above all, if “what we call nature is a poem that lies enclosed in a secret, wonderful script [*was wir Natur nennen, ist ein Gedicht, das in geheimer wunderbarer Schrift verschlossen liegt*],”<sup>22</sup> then the only adequate way to comprehend and present it is to rewrite this one and the same archetypal poem in human language. Therefore, human knowledge should constitute a system endowed with the same plastic form and capacity as nature and poetry.

It is now clear that Humboldt indeed has a romantic, philosophical mind, but the often overlooked fact is that Humboldt also remains critical of this romantic natural philosophy. His criticism is straightforward:

Contrary to the wishes and counsels of those profound and powerful thinkers who have given new life to speculation belonging to antiquity, systems of a philosophy of nature [*naturphilosophische Systeme*] has in our country (Germany), turned men's mind for a time from the graver studies of mathematical and physical sciences. The intoxication of the supposed conquest already achieved,—a novel and extravagantly symbolic language [*eine eigene, abenteuerlich-symbolisierende Sprache*],—a predilection for formulae of scholastic reasoning [*Schematismus*] more contracted than were ever known in middle ages,—have through the youthful abuse of noble powers, characterised the short saturnalia of pure ideal science of nature [*haben, in jugendlichem Mißbrauch edler Kräfte, die heiteren und kurzen Saturnalien eines rein-ideellen Naturwissens bezeichnet*].<sup>23</sup>

If for Schelling, natural inquiry is supposed to primarily contain the systematic construction of the genesis of natural beings, *a priori* unfolding the principles of the possibility of all kinds of natural product capable of being, for Humboldt, the speculative extravagance of this Schellingian project must be rescued by the continuous enlargement and refinement of empirical observation.

If for Schelling, by means of exhibiting the gradual bringing-forth of the “whole multiplicity of its products through continuous deviations from a common ideal,” the descriptive natural history is elevated to a higher level and enter the whole new epoch of the true history of nature,<sup>24</sup> the same elevation, agreed by Humboldt to be one of the contemporary imperatives, is nevertheless primarily achieved by rehabilitating an Aristotelian empirical way of inquiry.<sup>25</sup> This Aristotelian empiricism, if properly romanticised, constitutes “the only ground” on which Humboldt moves “without a sense of insecurity.”<sup>26</sup>

<sup>23</sup> Humboldt, 1846, p. 63[69].

<sup>24</sup> Schelling, 1799, SW, I, 3, p. 68; translated by Peterson, 2004, p. 53.

<sup>25</sup> Humboldt's recourse to Aristotle can be traced back to as early as 1794 in his letter to Schiller, in which he demands a “higher” dimension of natural history that escapes both “men given to speculation” and “miserable archivists [*Registratoren*] of Nature.” This higher dimension is believed to be epitomised by Aristotle (and Pliny), who “included in their description of Nature both the aesthetic sense and the artistic education of man” (quoted from Godlewska, 1999, pp. 244–245). It should be no surprise that this Aristotelian predisposition had an aesthetic and moral provenance, and that it later developed into a methodological adherence with a romantic rendering. Indeed, Humboldt reads Aristotle in such a way that he attributes to Aristotle the first attempt at a fundamental romantic idea of nature, namely, all appearances of nature collectively present “the moving vital activity of a universal world-force [*bewegende Lebenstätigkeit einer allgemeinen Weltkraft*]”; 1846, p. 45[52].

<sup>26</sup> *Ibid.*, pp. 53, 62. In fact, a shared imperative to establish new methods of natural inquiry preoccupied Humboldt and his contemporary romantics like Goethe, Novalis, Schelling, and Coleridge. And what crystallises in Aristotle's sciences (both his physics and zoology), as Humboldt believes, is precisely the mode of empiricism that they need, which a) commits to the material substantiality and historical worldliness of the “particularities of reality [*Einzelheiten der Wirklichkeit*]” (in Aristotle's words, a multiplicity of ‘certain this-es’), for which no formalisation can be adequate, and b) at the same time assumes an immediate apprehension of the presence of universals and of essences [*Wesen*] of forms in generalisation of these particularities, followed by the exposition of the embodiment of theoretical and moral ideas that bear necessity therein. For Humboldt's appreciation of the fecundity of this mode of empiricism, of its blossoming in Aristotle's sciences, and of its need for new romantic animation, see 1845, pp. 31–32, 59; 1847, p. 206; 1849, II, p. 243. For an overview of intricacies of Aristotle's empiricism and its application to natural sciences such as biology, cf. Dawes, 2017 and Lennox, 2021. It is worth noting that the tender, revisionary, romantic empiricism of Herder, Goethe, and Erasmus Darwin exposes this ‘empirical’ engagement further down to the level of corporeal sensation, revealing a poetic-cultural physiology that mediates between subject and object; see Goldstein, 2014, 2017, 2018.

<sup>15</sup> Dettelbach, 1999; Daston, 2010, 2008.

<sup>16</sup> Novalis, 1997[1798-1799], entry 66 (translation modified).

<sup>17</sup> Novalis, 2007[1798/1799], entry 87.

<sup>18</sup> Goldstein, 2017, pp. 4, 7. For Romantic's belief that poetics serves as the archetypal activity informing and encompassing human representative process, see also Bernstein, 2003; Goldstein, 2014; Gorodeisky, 2016.

<sup>19</sup> Schlegel, 1991[1798], entry 116. Novalis agrees that “every science will be poetry—after it has become philosophy”; Novalis, 2007[1798/1799]/1799, entry 684.

<sup>20</sup> Schlegel, 1991[1798], entry 238.

<sup>21</sup> Novalis, 2007[1798/1799], entry 429.

<sup>22</sup> Schelling, 1800, SW, I, 3, p. 628. For Schelling, “the objective world is only the original yet unconscious poetry of spirit [*Die objektive Welt ist nur die ursprüngliche, noch bewußtlose Poesie des Geistes*],” and thus philosophy of art forms the universal organon of true philosophy and “the keystone of its whole vault [*der Schlußstein ihres ganzen Gewölbes*]”; 1800, SW, I, 3, p. 349.

In summary, Humboldt is sympathetic but remains vigilant towards the radical Platonic tendency of romantic philosophy widely condemned for its succumbing to the unfettered poetic and speculative vehemence. To mitigate, but not to prohibit, this imposing and detaching power of the mind, Humboldt appeals to the Aristotelian science as exemplary of experience-anchored, active human knowing. Studies of both human and nature in both history and science should be based on this common ground. In pursuit are keen observations animated by a creating spirit [*Geist*] and the grace [*Anmut*] of diction.<sup>27</sup> Humboldt thus appropriates Aristotle's empiricism in the light of romantic philosophy and in turn revises the latter. In this way, he brings forward a critical concordance that he believes remedies both the “emptiness of speculation [*Hohlheit der Speculation*]” and the “presumptuousness of the empirical method [*Anmaßung der Empirie*].”<sup>28</sup> Following the criticism, Humboldt adds: “I say abuse of powers, for superior minds, which have embraced both speculative studies and experimental sciences, took no part of this saturnalia.”<sup>29</sup> It is this superior mind central to the figure of Humboldt as a philosophical naturalist that I believe characterises both Humboldt and Darwin.<sup>30</sup>

## 2.2. The evolving reception of romanticism in Humboldt's science

It must be noted that Humboldt's science has its history, and it would be misleading to take it as fixed throughout his lifelong scientific career and as inherited as such by his successors. This inclination is reflected in big labels such as ‘Humboldtian Science’ and ‘Romantics’ Romantic,’ and leads scholars to futile disputes as to whether Humboldt is essentially an enlightenment scientist or a romantic *Naturphilosoph*.<sup>31</sup> To correct this ahistorical inclination, a brief remark on how Humboldt's mode of natural inquiry was modified throughout his career is given below to illustrate the idiosyncratic path of the development of his science.

In fact, not only did his focus shift from experimental physiology and underground botany to a comprehensive physical-geographical investigation, but also his early endorsement of romantic tenets received self-reflections and reached a more subtle position. His conception of vital force and his view on poetry-science relation stand as revealing examples.

In 1795, Humboldt published an article titled ‘Der rhodische Genius’ in *Die Horen*, a literary journal run by Friedrich Schiller. It was composed to be a poetical myth, narrating the discovery of two ancient paintings in Syracuse. The two paintings symbolise the function of vital force (i.e., preventing the original organic form from being dissolved by the prevailing chemical affinity) by picturing respective consequences of its presence and absence through figures' countenance, actions, and interactions. The symbolic meaning is then uttered by Epicharmus, an ancient philosopher of the Pythagorean school, who witnesses the mysterious discovery and follows related discussions.

The same article was later republished under the title of ‘Die Lebenskraft oder der Rhodische Genius’ in the second (1826) and third editions (1849) of *Ansichten der Natur*. In the accompanying “Illustration and Note,” however, Humboldt reiterated his revision of the concept that had been proclaimed in *Versuche über die gereizte Muskel- und Nervenfasern* (1797).<sup>32</sup> The previous idea was dismissed that takes vital force as an unknown causality and an imponderable substance functioning secretly. Instead, Humboldt withdrew from the theoretical ambition to give essential formulations to vital force and turned to a definition of life that is nothing more than an “expression of the fact [*Ausspruch einer Thatsache*].” From this point of view, the animated substance is that “whose voluntarily separated parts change their composition after separation has taken place, the former external relations still continuing the same.”<sup>33</sup> Thus, Humboldt offered an operational criterion that converts the enigma of organism into a set of observable and testable facts. In the third edition, Humboldt further declared his insistent dismissal of this idea of vital force, quoting *Kosmos* (1845), and his belief in the possibility of reducing vital phenomena to ordered coordination of universal forces which are common to the inorganic and the organic and which are measurable.<sup>34</sup>

On the other hand, the single reappearance of this early semi-myth evinces the evolving tension between the poetic and scientific commitments of Humboldt. In fact, Humboldt witnessed and participated in the ongoing disjunction between philosophical-scientific and literary-poetic discourses in the early nineteenth century. In the preface to the first edition (1808) of *Ansichten der Natur*, Humboldt concerned himself with the “aesthetic mode of treating subjects of Natural History [*ästhetische Behandlung naturhistorischer Gegenstände*],” which must proceed in accordance with the compositional principle elaborated by Novalis, Schlegel, and Coleridge, i.e., “each essay is designed to be complete in itself; and one and the same tendency pervades the whole.”<sup>35</sup> But he at once conceded that such an undertaking is challenging in execution. The essay seeking unity of feelings and ideas would easily degenerate into a “poetic prose [*dichterische Prosa*]” that is nothing but a lack of “style [*Haltung*].”<sup>36</sup>

In the preface to the second (1826) and third (1849) editions, the tension, as well as the goal, persisted, and the main obstacle was then explicitly acknowledged as the discrepancy between literature and science, imagination and knowledge:

The combination of a literary and a purely scientific aim, the desire to engage the imagination and at the same time to enrich life with new ideas by the increase of knowledge [*der Wunsch, gleichzeitig die Phantasie zu beschäftigen und durch Vermehrung des Wissens das Leben mit Ideen zu bereichern*], render the due arrangement of the separated part and what is required as unity of composition, difficult to attain.<sup>37</sup>

Nevertheless, on the one hand, Humboldt never gives up restoring the integrated whole of different discourses, as indicated, for example, by his incorporating ‘The Rhodian Genius’ in new editions of *Ansichten der*

<sup>27</sup> Humboldt, 1847, p. 206.

<sup>28</sup> Humboldt, 1845, p. 69 (my translation). In Coleridge, this epistemic concordance is termed as the “method” that gives rise to both unity and progression; Coleridge, 1818.

<sup>29</sup> Humboldt, 1846, p. 63.

<sup>30</sup> Humboldt might exempt Schelling himself from the imputation of abuse that is rather apt for his uncritical adherents; see Werner, 2000.

<sup>31</sup> William H. Goetzmann first coined the term ‘Humboldtian Science’ in 1959. It was then reformulated and made known by Susan Faye Cannon in 1978 as ‘Humboldtian Science’. Cannon's reformulation dismisses the romantic characterisations given by Goetzmann and intends to designate the pervasive mode of empirical inquiry across the Atlantic in the nineteenth century, which was highly engaged in the extensive observation, precise measurement, and accurate mapping and graphing; see Goetzmann, 1959; Cannon, 1978, pp. 73–110. For criticisms and revisions of the term, see Nicolson, 1987; Dettelbach, 1996; Anthony, 2018. For synthetic explanations of Humboldt's science, see Dettelbach, 1999, 2001, 2007; Macleod, 2007. The expression ‘Romantic’ Romantic’ is used by Ruse to describe a romantic Humboldt as one of those “incontestable facts” agreed by him and Richards; Richards & Ruse, 2016, p. 190.

<sup>32</sup> Richards notes this shift of Humboldt's thoughts at the end of the eighteenth century yet without further examining its indication; 2002, pp. 316–321.

<sup>33</sup> Humboldt, 1850, pp. 380–389.

<sup>34</sup> Both Schelling and Humboldt criticised the concept of *Lebenskraft*, yet from different perspectives. Humboldt discredited this idea as indemonstrable by observations and measurements and thus invalid. In contrast, Schelling condemned its self-identification as a force [*Kraft*] and the resultant transcendental insufficiency as either the genetic or the epistemic ground of the organisation and life. Schelling thus demanded an *a priori* construction and opted for a revised concept of *Bildungstrieb*; see Schelling, 1803, SW, I, 2, pp. 49–51; 1806, SW, I, 2, p. 566; 1799, SW, I, 3, p. 80.

<sup>35</sup> Humboldt, 1850, p. Ix[viii]. Both the preface to the first edition and that to the second and third editions were included in the 1850 English translation. For Novalis's and Schlegel's views on a poetic system, cf. Nassar, 2013, pp. 71–77, 126–155. For Coleridge, see 1817, II, pp. 9–11.

<sup>36</sup> Humboldt, 1849, I, p. viii-ix (my translation)

<sup>37</sup> Humboldt, 1850, p. xi[xi].

*Natur*. The article in the first place constitutes the immediate instance of the combination of poetry and science and then the reminder of it in its dissolution. On the other hand, he encourages human beings to explore the dormant fecundity of these separated, newly established realms and to develop the still latent human capacities evoked thereby.<sup>38</sup> Therefore, Humboldt is no less romantic than Novalis to the very extent that they all realise that by virtue of the diversification of discourses and methods and the prospect of the unification opened up precisely by this diversification, “the thinker eventually knows how to make everything, out of each thing [*am Ende weiß der Denker aus Jedem Alles zu machen*],” and thus “the philosopher becomes a poet,” i.e., a “Goethean philosopher or thinker.”<sup>39</sup>

In contemporaneous Britain, the imported German philosophy and science was confronted with the tradition of British empiricism and later also the doctrine of positivism. Although Coleridge and some others, such as his executor and disciple Joseph Henry Green, promulgated an essentially Schellingian systematic philosophy and science, an indifference to transcendental and metaphysical contrivances and poetic discourse grew and hence a gradual retreat from the genetic dynamics of the ideal entertained by idealists.<sup>40</sup> An ambivalence thus can be found, e.g., in William Whewell’s appraisal of Goethe’s principle of metamorphosis. In general, he raises similar oppositions as Humboldt does to the over-philosophising propensity of *Naturphilosophie* and romantic sciences:

It may be regarded as an indication of how peculiar are the principles of organic life, and how far removed from any mere mechanical action, that the leading idea in these speculations was first strongly and effectively apprehended, not by a laborious experimenter or reasoner, but by a man of singularly brilliant and creative fancy; not by a mathematician or a chemist, but by a poet [...] this poet had already shown himself incapable of rightly apprehending the relations of physical facts to their principles; and had, in trying his power on such subjects, exhibited a signal instance of the ineffectual and perverse operation of the method of philosophising to which the constitution of his mind led him [...] he relates his botanical studies and his habit of observation, from which it is easily seen that no common amount of knowledge and notice of detail, were involved in the course of thought which led him to the principle of the Metamorphosis of Plant.<sup>41</sup>

Conceding Goethe’s merit of expounding the “genuine organic and physiological ideas; —real element of the philosophy of life,” Whewell nevertheless discredits Goethe’s methodology for its lack of the scientific sagacity and empirical ground.<sup>42</sup> However, the issue is left unanswered by Whewell: how is it possible for a poet relying on an unjustified method to be so competent to reveal the genuine truth about the organic being in an unprecedentedly “distinct and persuasive manner?”<sup>43</sup> Does it not indicate that this overly condemned idealistic mode of inquiry should be recognised as productive and capable? Whewell does not fully address this issue but merely takes the poetic origin of this “ideal conception” as the indication of the peculiarity of organic life and the science of it.<sup>44</sup> The answer is rather given by *Naturphilosophen* and romantics themselves, including Humboldt, that rigorous empirical investigations necessarily conform with genuine constructions of speculative reason or poetic imagination.<sup>45</sup> The true

“primordial necessity” of nature is a postulate of living reason unfolding into manifold interconnected consciousness through empirical investigations.<sup>46</sup> It is the task of “the highest degree of the thinker, or senser” to pursue this congruity between both in their interpenetration and interanimation.<sup>47</sup>

### 2.3. Darwin’s reception of Humboldt and his science

Before moving on to thematic elaborations in the third part, an account of Darwin’s reception of Humboldt will conclude the historically informed interpretation of the second part.

In the first place, there is no doubt that Humboldt had always been in Darwin’s view since he was first introduced to Darwin during his Cambridge years. Humboldt’s *Personal Narrative* motivated his strong interest in scientific expedition and natural philosophy, and John Stevens Henslow’s botanical course brought him to Humboldt’s physiological and geographical discussions. Humboldt’s paper on isothermal line translated in *Edinburgh Philosophical Review* (1820) was also on his reading list at this time.<sup>48</sup> This pre-Beagle dedication led to a highly Humboldtian voyage and a following productive period of thinking and writing when Humboldt’s works were widely reflected on. On the Beagle, Darwin kept not only the multi-volume *Personal narrative* (1814–1829), but also *Political essay on the kingdom of New Spain* (1811), *Essai géognostique sur le gisement des roches dans les deux hémisphères* (1826), and *Fragmens de géologie et de climatologie asiatiques* (1831). Although no record on the Beagle is found, Darwin indeed requested that *Tableaux de la nature* (1828) be delivered during the voyage. This book is the translation of the second edition (1826) of *Ansichten der Natur* and had long stirred his enthusiasm since his Cambridge time about the “peak of Teneriffe and the great Dragon Tree” in the tropics.<sup>49</sup> His exploration of Humboldt’s publications continued after returning to Britain. He returned to those he had already read and followed new ones in 1840s, including *Kosmos* and the new edition and translation of *Ansichten der Natur*.<sup>50</sup>

This extensive and persistent reading of Humboldt brought to Darwin in his formative years the avant-garde of contemporaneous natural philosophy and science and shaped his later research.<sup>51</sup> He showed to Darwin “what could be done by observation during prolonged intervals” and educated Darwin to be a true philosophical naturalist rather than “a mere collector” that he had been at the beginning of the Beagle voyage.<sup>52</sup> Until Darwin’s late works, Humboldt still stands as a trustworthy observer, on the accuracy of whose statement he does not “wish to throw the least doubt.”<sup>53</sup>

<sup>46</sup> Humboldt, 1846, p. 33.

<sup>47</sup> Novalis, 2007[1798/1799], entry 717.

<sup>48</sup> Charles Darwin to Susan Darwin ([4 September 1831]), in Burkhardt et al., 1985–2015, Vol. 1, p. 139. This critical issue is also covered by Henslow’s botanical course with reference to Humboldt; Henslow, 1836, p. 296.

<sup>49</sup> Charles Darwin to Catherine Darwin (5 July [1832]) and Caroline Darwin ([28 April 1831]), in Burkhardt et al., 1985–2015, Vol. 1, pp. 247, 122.

<sup>50</sup> The first two volumes of *Kosmos* were officially published in English in 1846 and 1848. Darwin read them almost immediately after the publication. The third edition of *Ansichten der Natur* (1849) was translated as *Aspects of Nature* in 1849 and as *Views of Nature* in 1850. Darwin read the 1849 version in February 1852. For which Humboldt’s works Darwin read, cf. Bibliography, in Barrett et al., 1987, pp. 672–673; Appendix IV, Darwin’s reading notebooks, in Burkhardt et al., 1985–2015, Vol. 4, p. 435–537.

<sup>51</sup> For a recent discussion of how theories and data in Humboldt’s writings contributed to Darwin’s scientific practices on Beagle, especially to his hydrographical investigations and his theory of coral reef formation, see Sponsel, 2018, pp. 33–80.

<sup>52</sup> Darwin to D. T. Gardner ([c. 27 August 1874]); Burkhardt et al., 1985–2015, Vol. 22, p. 422. Darwin to W.T. Preyer (17 February 1870); Vol. 18, p. 42.

<sup>53</sup> Darwin, 1872, p. 144.

<sup>38</sup> Humboldt, 1847, pp. 399–400.

<sup>39</sup> Novalis, 2007[1798/1799], entry 717.

<sup>40</sup> For this Schelling-inspired British philosophical and scientific project of Coleridge and Green, see Coleridge, 1817, 1818; Green 1992[1827], 1865.

<sup>41</sup> Whewell, 1837, III, pp. 434–436.

<sup>42</sup> Ibid., p. 443.

<sup>43</sup> Ibid., pp. 438–439.

<sup>44</sup> Whewell, 1840, I, p. 35. Understanding Kant and Schelling in a simplified, technical way, Whewell explains the dynamics of idea and conception in terms of the technique of induction; cf Sloan, 2003b.

<sup>45</sup> For Humboldt’s assertion of the significance of speculative thought if it is not led astray into extravagance and unsoundness, see 1846, pp. 63–66; also see Humboldt & Bonpland, 1807, p. v.

Darwin adduced Humboldt broadly. His red notebook (1836–1837) and notebook A (1837–1839) suggest an intensive study of Humboldt's geology and mineralogy. He perhaps also learned about Humboldt's conception of *Lebenskraft*.<sup>54</sup> In addition, he consulted Humboldt regarding issues of the extinction of species, the geographical distribution and migration of plants, the expression of emotions of animals, and South American indigenous people's predilection for ornaments.<sup>55</sup> In *Descent*, Darwin quoted Humboldt's judgement about the rational capacity of animals, which indicates an anti-cartesian view of life and an empirical approach to it:

The muleteers in S. America say, "I will not give you the mule whose step is easiest, but *la mas racional*,—the one that reasons best;" and Humboldt adds, "this popular expression, dictated by long experience, combats the system of animated machines, better perhaps than all the arguments of speculative philosophy."<sup>56</sup>

On the other hand, Humboldt's works implanted a romantic sensibility in Darwin's mind, i.e., a predisposition and capacity to take as the proper object of natural inquiry nature as a whole of both lawfulness and beauty. Humboldt designated the twofold significances with the Greek word 'cosmos' and further romanticised it by exposing its inner Goethean developmental dynamics. For Darwin, in the same vein, not only the change and the complexity but also the beauty of the adaptations and coadaptations among all organic beings should be explained.<sup>57</sup> More importantly, the beauty of nature was not raised beyond the substantial nature as William Paley did.<sup>58</sup> Rather, it was an intrinsic property that can be analysed in accordance with various laws of nature and the human mind. Whether it conforms to a purposive design or not is not the criterion. For example, even if some natural laws such as "reversion and analogous variations" may not occasion "new and important modifications" purposive for adaptations, they "add to the beautiful and harmonious diversity of nature" and offer pleasure to the mind.<sup>59</sup>

It is worth noting, however, that *Personal Narrative* takes the central place of Darwin's preoccupation with Humboldt's oeuvre. A decisive influence was always attributed to it by Darwin himself.<sup>60</sup> When Darwin's *Journal of Researches (1839)* appeared in the same spirit of Humboldt's

<sup>54</sup> Henslow's course substantially examines operations of the vital force in the vegetable world. Humboldt's concept is likely part of those discussions between Henslow and Darwin. Erasmus Darwin's *Zoonomia* perhaps offers another avenue, with which Charles Darwin was familiar and on which, as Humboldt admitted in his only letter to Darwin (19 September 1839), he drew "with ardour" in developing his *Versuche über die gereizte Muskel- und Nervenfasern* (1797); Burkhardt et al., 1985–2015, Vol. 2, pp. 218–222.

<sup>55</sup> See Barrett et al., 1987, D 69, E 182e, pp. 356, 453; also Darwin, 1872, p. 144; 1871, II, pp. 339, 351–352.

<sup>56</sup> Darwin, 1871, I, p. 48. As Darwin's notes indicate, this shared anti-cartesian view of life led to the consideration of the ultimate underlying living principles of being and thinking; see section 3.2 below.

<sup>57</sup> Darwin, 1859, p. 109; also see pp. 61, 130, 224, 469. The appreciation of the beauty of nature within theorisation is a leitmotiv in Darwin's writings. His notebooks show he even attempts to account for the causes of the beauty linked to the pleasure of scenery. He regards 'form' as the second cause, and, referring to Humboldt and Erasmus Darwin, argues for the beauty of the rhythm and symmetry of forms applied to the whole, whether it is the whole of a plant or a view; Barrett et al., 1987, M 36–41, pp. 528–529.

<sup>58</sup> Paley explained natural beauty as the intelligent "provision" made by the Deity to adapt the appearance of one being to the perception of the other; Paley, 1803, p. 212.

<sup>59</sup> Darwin, 1859, p. 169.

<sup>60</sup> See Darwin to J. D. Hooker (10 February 1845): "I never forget that my whole course of life is due to having read & reread as a Youth his [Humboldt's] *Personal Narrative*"; Burkhardt et al., 1985–2015, Vol. 3, p. 140. Darwin to W. T. Preyer (17 February 1870): "But of all books, Humboldt's *Travels* had by far the greatest influence—I read large parts over & over again"; Vol. 18, p. 42. Also, in his autobiography, Darwin famously confessed that it was Humboldt's *Personal Narrative* and Herschel's *Introduction to the study of Natural Philosophy* that prompted him to dedicate his life to the edifice of natural science; 1887, I, p. 55.

*Personal Narrative*, he felt very much honoured to receive Humboldt's praise and to be one of his disciples.<sup>61</sup> In contrast, *Cosmos* drew an explicit critical attitude, though still entertained by Darwin. Darwin stood with John Herschel, who meticulously examined Humboldt's merits and defects in his review of the first volume of *Cosmos*.<sup>62</sup> Herschel thinks highly of Humboldt's scientific attainments, which, according to him, are far beyond the reach of a mere ideal speculatist and man of mere imagination and eloquence. Also, he values Humboldt's pursuit of both sound knowledge and thoughtful poesy as the source of charm. Nevertheless, Herschel questions Humboldt's ontological prioritisation of force over matter and his epistemological deflection from causal explanation in favour of mere discovery and generalisation of laws, which Herschel regards as not completely fit for the philosophical zeitgeist. Darwin appeared to hold a similar position as he admitted that Herschel's review "struck" him "as very good."<sup>63</sup>

Another fact is that although both Darwin and Humboldt kept a good deal of contacts throughout Europe and long occupied the centre of the scientific republic of letters, as noted in a letter by F. C. Donders, few direct correspondences between them were found.<sup>64</sup> Since then, they became increasingly focused on different domains and themes—the occasions for fruitful dialogues were rare. Further in 1881, when Darwin could evaluate Humboldt from a rather distant intellectual vantage point than he could as a youth, he said:

I believe that you are fully right in calling Humboldt the greatest scientific traveller who ever lived. I have lately read two or three volumes again. His *Geology* is funny stuff; but that merely means that he was not in advance of his age. I should say he was wonderful, more for his near approach to omniscience than for originality. Whether or not his position as a scientific man is as eminent as we think, you might truly call him the parent of a grand progeny of scientific travellers, who, taken together, have done much for science.<sup>65</sup>

To summarise, the impact of Humboldt on Darwin was no doubt far-reaching. He offered Darwin a general romantic horizon of nature at his young age and a type of natural inquiry that deserves pursuing. More importantly, as Herschel remarks, Humboldt had led the ever best path through "the labyrinth of this vast mass of knowledge" regarding organic life and brought "the phenomena to bear on each other with due regard to cause sequence"; thus, Humboldt crystallised and accentuated the "fact of the first magnitude," i.e., "a general system of regional repartition which pervades the whole scheme of organic life," which Darwin would soon find himself warranted and compelled to take as one of the central issues his theory must satisfactorily explain.<sup>66</sup>

Nevertheless, Humboldt was also a target of criticism, especially at Darwin's mature age, for the sake of the coherence of his own theoretical reasoning beyond the point at which Humboldt had stopped. Therefore, if Humboldt left Darwin any romantic legacy, it would be a sophisticatedly converted one. To clarify this romantic legacy requires an analysis of both its adherence to and departure from the original significance of 'being romantic', which arises in original articulations of early Romantics.

<sup>61</sup> Darwin to Humboldt (1 November 1839); Burkhardt et al., 1985–2015, Vol. 2, pp. 239–240.

<sup>62</sup> Herschel, 2014[1848].

<sup>63</sup> Darwin to Edward Cressy ([May 1848]); Burkhardt et al., 1985–2015, Vol. 4, p. 135.

<sup>64</sup> F. C. Donders to Darwin (17 April 1872, translations cited from Darwin Correspondence Project, "Letter no. 8290," <https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-8290.xml>); Burkhardt et al., 1985–2015, Vol. 20, p. 162. The only known correspondences between the two, besides the lost earliest one from Darwin to Humboldt, are: Humboldt to Darwin (19 September 1839) and Darwin to Humboldt (1 November 1839), Vol. 2, pp. 218–222, 239–240.

<sup>65</sup> Darwin to J. D. Hooker (6 August 1881), in Cambridge University Digital Library, MS DAR 95: 518–23.

<sup>66</sup> Herschel, 2014[1848].

### 3. Thematic comparisons between Darwin and his romantic predecessors

Based on the reflections above, I will explicate in this section three interrelated themes of which a romantic natural inquiry partakes in general and that adequately, though perhaps not exhaustively, capture the main disputes regarding Darwin's romantic stance: the literature-science relation, the pursuit of the unity in and through multiplicity, and the epistemic function of imagination. I hope that in this way, the issues of whether, in what sense, and to what extent Darwin owed a debt to romanticism can be made clear.

#### 3.1. On the literature-science relation

The literary legacy of Humboldt to Darwin has long been a consensus. The great predecessor Humboldt became the icon for philosophical writers and naturalists, according to which Darwin conceived of and embarked on sagacious and zealous explorations and investigations. It is in a Humboldtian spirit that Darwin, in his *Journal of Researches*, combines with the celebration of the sublime and beautiful particularities the epistemic dedication to laws of nature, and presents his observations and contemplations poetically. As Caroline Darwin observed, Darwin embodies his ideas in Humboldtian “phraseology,” “flowery french expressions,” and “poetical language” even “without perceiving it.”<sup>67</sup>

However, it is one thing to assert this literary legacy as an invitation to a well-established tradition of travel writing that combines emotional expressions and scientific requests, while quite another to determine Darwin's romantic stance on its basis. The fact is, from the late Enlightenment to the early decades of the nineteenth century, natural inquiry, especially that of the physical earth and organic life, was as much a literary endeavour as a theoretical one to produce and popularise knowledge. As O'Connor captures, in this period, it is not that “science writing and literature enjoyed a fruitful relationship,” the reconciliation between which presupposes their distinction, but “science writing was literature.”<sup>68</sup> They were one and the same art of composition and production. From O'Connor's perspective, the self-conscious entanglement of science with poetry, the pursuit of the heterogeneity from within the view to the unity, and the recognition of the formative role of imagination in scientific knowing, all of which are interpreted above in Humboldt's case in reference to romanticism, are in fact corollaries of Enlightenment epistemological demands epitomised by Lyellian geology.<sup>69</sup>

Thus, it did not have to be romanticism that introduced a poetical mode of thinking into science. Nevertheless, O'Connor's claim indeed suggests a moderate sense in which romanticism itself engages with science, namely, romanticism serves as an integral yet subordinated part of the broad horizon of sensibility. It functions as a supervised poetic chapter thereof encouraging the incidental aesthetic and moral judgements, the due commitments to the materiality of individual substances, and the well-circumscribed transgressive cognitive interludes. If the scientific relevance of romanticism is understood as such, which undoubtedly belongs to the multi-faceted self-understandings of romanticism and which draws from Humboldt's science profound incentives, then there would be few controversies regarding Darwin's romantic stance: Darwin's science is romantic, as contended by a wealth of research.<sup>70</sup>

However, if romanticism is understood in its original sense, that is, in accordance with original articulations of early German Romanticism [*Frühromantik*] and its British variety represented by Wordsworth and

Coleridge, the conclusion turns out to be nuanced. Remember, the key principle of romanticism is the primacy of aesthetic experience, or rather, the primacy of poetry and poetics. Rather than merely performing a superimposing function, poetry acts as a universal, progressive and transcendental principle, as the open-ended texture into which the truth of inner life and of external world interweave, and as the highest way of being and knowing for which philosophy and science are destined. In Coleridge's terms, poetry presents a middle “method” mediating *a priori* laws pertaining to pure sciences and those dependent on external objects of senses in mixed and applied sciences. It carries “a uniting and a progressive power” that balances the “vegetating and geminating” ideas and those passive impressions through which ideas blossom.<sup>71</sup> Thus, it anticipates the coherent arrangement of human knowledge, and the aim of the education of the mind is precisely to master this method. Therefore, in the romantic poetry-science relation, poetry is “the key” as well as the “purpose and meaning” of science.<sup>72</sup>

From this perspective, Darwin is radically far from being of the same type as his antecedent romantic poet-philosophers. Although Beer convincingly shows that Darwin incorporated through his reading of romantic poets “diverse mind-words” that profoundly contributed to his intellectual upbringing,<sup>73</sup> it is notable that his youthful attentiveness to poetry did not obtain as much sheerness as that of Humboldt and other romantics. No bewilderment at the tension between science and poetry ever appeared in his publications, nor did any self-conscious endeavour towards a reunion of scientific and poetic discourses, with which early romantics were obsessed as they witnessed the ongoing departure between them. Never pursuing the ideal of the “philosophising poet” and “poetising philosopher,”<sup>74</sup> Darwin appeared sympathetic to a Comtean naturalistic and positive understanding of science as many of his contemporaries like Thomas Henry Huxley and George Henry Lewes.<sup>75</sup> His concerns with poetry ended up with scattered comments in his notebooks and reminiscences in his autobiography.

However, this fact should not lead to judging Darwin as a Victorian positivist scientist eschewing appeals to romantic-idealistic interventions in the same way as some historians of science misjudge Humboldt. In fact, Darwin followed those inspiring ideas of romantic poets regarding instinct, consciousness, emotion, and morality. He illustrated the human conscience quoting Coleridge: “The fledge-dove knows the prowlers of the air.” And he saw the “best feeling of sympathy” manifesting in fine poetry and music.<sup>76</sup> Through reading John Stuart Mill's review of Coleridge (1840), Darwin related the Kantian and Coleridgean concept of *a priori* knowledge without experience to the existence and amount of instinct.<sup>77</sup> Echoes of these early considerations can be found in *Descent*, where he attempted a naturalistic explanation of conscience, or pure moral knowledge, though this time he attributed its classic formulations entirely to Kant.<sup>78</sup>

Furthermore, those romantic poet-philosophers he read left such enduring imprints onto his intellectual landscape that they finally occasioned a “loss” and “atrophy,” when he found that he could no longer take the same delight in poetry, painting, and music and that his mind suffered from becoming “a kind of machine for grinding general laws out

<sup>71</sup> Coleridge, 1818.

<sup>72</sup> Novalis, 1997[1798-1799], entry 25.

<sup>73</sup> Beer, 2010.

<sup>74</sup> Schlegel, 1991[1798], entry 249; Coleridge, 1818.

<sup>75</sup> Barrett et al., 1987, M 69–70, pp. 535–536.

<sup>76</sup> *Ibid.*, M 88–89, p. 540.

<sup>77</sup> *Ibid.*, OUN 33, p. 610. In his review of Coleridge, Mill claims his approval of empiricism, yet he considers the transcendental-idealistic philosophy of Coleridge and his German predecessors as equally legitimate and fecund. He argues further that the British doctrine of empiricism requires “an entire renovation” in the light of Coleridgean philosophy, especially regarding its naive non-differential treatment of human faculties and non-explanative verbal generalisation; Mill, 1840.

<sup>78</sup> Darwin, 1871, I, pp. 70–71.

<sup>67</sup> Caroline Darwin to Charles Darwin (28 October 1833); Burkhardt et al., 1985–2015, Vol. 1, p. 345.

<sup>68</sup> O'Connor, 2007, p. 13.

<sup>69</sup> *Ibid.*, pp. 163–190, 316–317.

<sup>70</sup> Kohn, 1996; Richards, 2002; Levine, 2008; Beer, 2009, 2010; Bradley, 2011; Lansley, 2018.

of large collection of facts.”<sup>79</sup> Above all, the Wordsworthian belief of “science being sufficiently habitual to become poetical” did not dissipate in his mind.<sup>80</sup> If to cultivate the mind to reach the state of being “more highly organised or better constituted” proper to aesthetic tastes is one of the goals of romanticism,<sup>81</sup> if being nostalgic of the lost harmony between science and poetry, nature and art, is characteristic of a mode of romanticism, even though it remains more susceptibility than a formative capacity, Darwin's mind is romantically sensitive, in a less active and voluntary manner than Humboldt and other true romantics.

### 3.2. On the unity in and through multiplicity

A common thread of romantics is the imperative to discern the unity in and through multiplicity. Although it is an issue that presides over multiple and diverse philosophical-biological inquiries of nature and life, a peculiar romantic cast is given when old philosophies and sciences are held to fail to do justice to the radical nature of the organism as intrinsically purposive and thus also misunderstand the nature of human beings.

First and foremost, this romantic unity itself constitutes an amphibious ideal-real whole epitomised by the organism. It is attained through combining its parts in their absolute causal reciprocity and simultaneity, and manifests itself in each of these parts as the underlying organising principle, whether at stake is a constitutive part of the organic composite or an individual of a genus. Moreover, the unity lies in the development. It ‘lives’ as an eternal activity, a productive archetype, an infinite process of metamorphosis. Hence, the multiple forms and functions are the constantly self-reproducing instantiations of this perpetually self-producing and producing unity.

The Goethean archetypal plant [*Urpflanze*] properly illustrates this concept, according to which the primary fact of a plant is that it always and only exists in formation and transformation and thus constitutes a formative unity. Its parts ceaselessly produce each other (e.g., leaves produce calyxes, and calyxes then produce petals) and exhibit different stages of the enduring metamorphosis of the whole. An archetype must thereby underlie as a law [*Gesetz*] and manifest in this very ‘being’ of the vegetable life, i.e., in its organised, purposive ‘becoming’ crystallised in a protean form. The general vegetable form thus becomes recognisable in accord with the archetype, and further the infinite, so far nonexistent yet potential plant forms are logically conceivable as its lawful modifications with “inner truth and necessity [*innerliche Wahrheit und Notwendigkeit*].”<sup>82</sup>

Now one can see that the unity as such is as real as an existing plant, for it presents its own reality by informing every particular real form, and it is as ideal as a pure idea postulated by the intellect, for it, as a transcendental schema, is prescribed to appearance with absolute universality and necessity. Thus, in grasping this ideality-reality, two movements congruously proceed: a) the ascending of the sensible, discrete manifold by means of the comprehension of imagination towards a so far latent idea, and b) the descending of the idea of a “synthetically universal”<sup>83</sup> intuitively understood towards its real constitutive parts, the organised and self-organising multiplicity of which are determined in the register of sensations. Therefore, this unity is both empirically fashioned and a *priori* posited, and it results from a purposive convergence of the two movements. In fact, there is no ‘before’ or ‘after’ here, but are two sides of one and the same activity of presentation [*Vorstellung*], in which the ideal and the real, thinking and intuiting are indistinguishable. To use Novalis's words, idealism is “nothing but genuine empiricism [*nichts, als ächter Empirismus*].”<sup>84</sup>

Darwin certainly bears this issue in his mind and with an explicit romantic bequeathal. Besides Humboldt's impact, Carl Gustav Carus's 1819 article also introduced Darwin to the romantic parlance of “constant manifestation of unity through multiplicity, that is, the manifestation of an internal principle or law through outward forms.”<sup>85</sup> It prompted Darwin in 1830s to consider “one living spirit ... which assumes a multitude of forms « each having acting principle » according to subordinate laws,” and “one thinking « (& Creat) sensible » principle ... which is modified into endless forms, bearing a close relation in degree & kind to the endless forms of the living beings,” and therefore a “Unity in thinking and acting principle in the various shades of (dif) separation between those individuals thus endowed.”<sup>86</sup> One can see Darwin's inchoate thoughts on the archetypal unity of beings were of a direct romantic semi-pantheistic inception.

In fact, Carus's and Goethe's transcendental anatomy offered Britain a more moderate and more plausible version of natural philosophy than Schelling and Lorenz Oken. It refrains from the fundamental interest of systematically presenting the universal performance and necessary generativity of both intelligence and nature in different branches of human knowledge based on their identity, an interest also found in Coleridge and Joseph Henry Green yet doubted by other naturalists. A notable fact is that although Owen followed Green's Hunterian Lectures in 1820s as a student and assistant, he noticed in them nothing but the “dawning philosophy of Anatomy” of Carus.<sup>87</sup> After receiving a set of empirical or theological revisions, this Carus's idea found its place in the so-called “Edinburgh diaspora” and Richard Owen's theory of archetype.<sup>88</sup> It finally furnished the schema of a developing unity from which the multiple radiate and return to.

Thus, also through his knowledge of Owen, a moderate transcendentalist doctrine of archetype entered Darwin's fabric of thought.<sup>89</sup> His comments on his copy of Owen's *On the Nature of Limbs* (held in the Manuscript Room of Cambridge University Library) nevertheless show a reorientation of his mind: “I followed him that there is a created archetype, the parent of its class”; also, “I look at Owen's Archetype as more than ideal, as a real representation as far as the most consummate skill & loftiest generalisation can represent the parent form of the Vertebrata.” He responded with a contrasting conviction for the possibility of a real representation to Owen's conclusive uncertainty as to whether the archetype is “the ultimate attainable generalisation or whether we may not gain an insight into the nature of the force by which all the modifications ... are still subordinated to a common type.”<sup>90</sup>

In order to demonstrate the reality of this unity and its modifications according to “laws of life,” Darwin implies that the whole domain of metaphysics of life might be traversed.<sup>91</sup> This Darwinian metaphysics, however, anticipates a deflationary acknowledgement similar to romantics of the inadequacy of human *understanding* in addressing both concrete

<sup>85</sup> Carus, 1837[1819]. This article was translated and published in *Scientific Memoirs* (pp. 223–254) in 1837. Darwin commented on p. 227: “the whole Universe a life, the plant a crystal, a life—i.e. his [Carus's] definition, but what commonly called life, a unity producing a different class of complexity than other unities.—Good idea—to show life only laws like universe.” This collection was part of “the strong incursion of German science and philosophy” in Britain in early decades of the nineteenth century; see Sloan, 1986.

<sup>86</sup> Barrett et al., 1987, C 210e–211, p. 305.

<sup>87</sup> Owen was not very keen on Green's gesture of combining the totality of “Zootomy” with “the unity of the higher philosophy, of the Science.” Rather, he doubted Green's real contribution to empirical researches and bodies of facts, on which he put much value and the idea of unity should be based; see Owen's letter to John Simon, in Simon, 1865, p. xiv–xv.

<sup>88</sup> Rupke, 2009, pp. 113–140. For revisions of German idealistic doctrines invited by Whewell and Owen, cf. Sloan, 2003b.

<sup>89</sup> Besides reading Owen's work and their discussions, Darwin probably even participated in Owen's famous Hunterian lectures in 1837; see Sloan, 1986.

<sup>90</sup> Owen, 1848, p. 171.

<sup>91</sup> Barrett et al., 1987, B 227–229. Also, C 104: “if any Metaphysical speculations are entered in upon life,” Carus's article “might be worth consulting.”

<sup>79</sup> Darwin, 1887, I, p. 101.

<sup>80</sup> Barrett et al., 1987, M 40, p. 529.

<sup>81</sup> Darwin, 1887, I, pp. 101–102.

<sup>82</sup> Goethe to Charlotte von Stein (9 June 1787); Mandelkow, 1964, p. 60.

<sup>83</sup> Kant, 2000[1790], 5: 407. I use Kant's term here, but it should be noted that Kant famously denies the human mind the faculty of intuitive understanding or intellectual intuition.

<sup>84</sup> Novalis, 2007[1798/1799], entry 402. For more on Novalis's empiricism, see Nassar, 2013, pp. 48–79.



determinations of the individual organism and the origin of life.<sup>92</sup> To remedy this inadequacy, romantics seek higher organising principles in the ideal world merely open to a productive *reason* so as to compensate the subservient, idealess [*ideenlos*] *understanding*. In contrast, Darwin adduces extensive empirical evidence to ascertain the plausibility of his hypothesis so that the ongoing causal approach to this indefinitely distant end is secured. Above all, a metaphysical “citadel” like this would remain inaccessible without “some *stable* foundation to argue from” being given.<sup>93</sup>

Along this line, significant semantic and philosophical alterations occurred of those previously romantically-idealistically informed concepts. Now, for Darwin, the ‘unity’ concerns solely with the observable kinship among morphological and anatomical arrangements of living beings, and the ‘conditions’ of existence with the observed natural circumstances and structural correlations under which local adaptations come to being. By holding ‘archetype’ to be the common progenitor or “ancient type”<sup>94</sup> and ‘metamorphosis’ to be the ontogenetic transformation and the phylogenetic modification and diversification of species descended from this common progenitor, Darwin substitutes the unity of descent for the unity of type and the principle of natural selection for that of conditions of existence, and then assimilated the former into the latter.<sup>95</sup> A new horizon of the genealogical investigation was opened to the human by means of this substitution and was believed to promise a genuine system of nature.

However, the cost of this conceptual manoeuvre is that the original conceptual scope of ‘archetype’, ‘metamorphosis’, and ‘form’ is significantly reduced, and their explanatory power is relinquished in favour of the positivist objective significance and an experimentally operable conceptual apparatus. The transcendental and metaphysical dive romantics made under the rubric of ‘origin’ and in terms of conditions of possibility is removed. The Darwinian archetype is now the descent relocated in the depth of history. It is no longer the romantic Absolute or Copula postulated bearing in its progressive development threefold potencies [*Potenzen*]—the infinite evolution [*Evolution/Einbildung*], the infinite involution [*Involution/Zurückbildung*], and their synthesis in organism;<sup>96</sup> nor does it, as Owen believes, partake of a “general and all-pervading polarising force” concurring with a Platonic “adaptive or special organising force” so as to secure the unity amid differential adaptations.<sup>97</sup> It is the fact of the modifiable descent situated within the purview of comprehensive empirical studies. In both Owen and Darwin, the romantic Spinozian, primordial and productive, synthetic unity *in* and *through* multiplicity is transformed into an analytical one *in* and *out* of multiple specific forms and functions. Further in Darwin, this distributive unity of organised beings retains its collectiveness in history rather than in a contriving higher mind. Thus, the cannon of ‘*Natura non facit saltum*’ upheld by Kant as a transcendental principle of reason, grounding the possibility of the systematic experience of nature yet itself empirically inaccessible, and by romantics as one of the inherent potencies of the self-sufficient nature in itself [*Natur an sich*], is now hypostatized by Darwin as a genealogical truth capable of a *posteriori* demonstration, at least in principle.<sup>98</sup>

Moreover, compared to Humboldt’s rehabilitation of an Aristotelian mode of empiricism to attenuate the speculative excess of idealistic natural history yet preserve its constructive role, Darwin stayed further away from deductive reasoning. He declared his approval of the inductive method, by which his mind was “so fixed,” though he admitted that it

might be “very narrow-minded.”<sup>99</sup> A similar methodological standpoint was shared by many other British naturalists. For instance, in his letter to Darwin, J. D. Hooker considered Humboldt as one of the few champions of *inductive* botany, in which he embedded the numerical method and which he thus made an exact science. Hooker is right when he contends that only in this way can “the leading fact” of the amount and the proportions of different floras in different localities be made tangible, and then the trace of “the progress of the creation of vegetation” be made possible.<sup>100</sup> Yet by virtue of his reformulation, Humboldt’s contribution of a statistical method to phytogeography was distilled from the underlying idealistic-aesthetic belief in numbers.<sup>101</sup> In the same vein, Darwin contrasted Kant’s method of studying human moral sense with his own as the deduction from within versus the induction from without: “the one man a great philosopher looking exclusively into his own mind, the other a degraded wretch looking from the outside thro ‘apes & savages at the moral sense of mankind.”<sup>102</sup>

Therefore, if romanticism is understood in terms of its radical penchant for the living unity in and through multiplicity by means of a type of ‘idealistic’ empiricism, Darwin did not embrace romantic tenets as such. He received and yet significantly transformed the conceptual and theoretical legacies from his romantic precursors.

Reservations, nevertheless, have to be made again. Although Darwin distanced himself from the Goethean and Schellingian *Gestaltenlehre* and *Verwandlungslehre*, a systematic comprehension of the morphological and functional unity and multiplicity was still the aim. To enunciate this comprehension, Darwin brought into play different discourses, the semantic and conceptual transpositions between which would facilitate the articulation of the hypothesis of natural selection. Despite the irreducible metaphoricity and indeterminacy thus introduced to Darwin’s terms and concepts, including ‘natural selection’ itself, a new understanding of the as yet unfathomable material realities and their correlated alterations nevertheless comes into theoretical language even without univocally established concepts at its disposal. Partly because of this, the so-called imperfect, tortuous “abstract” of the *Origin of Species* inevitably and sophisticatedly becomes “one long argument.”<sup>103</sup>

An example from the *Origin of Species* will show how the borrowing from different discourses enables Darwin to schematise and explicate something hitherto unuttered. It is an analogy between the evolution and development of organism/nature and human artistic making:

When we regard every production of nature as one which has had a history; when we contemplate every complex structure and instinct as the summing up of many contrivances, each useful to the possessor, nearly in the same way as when we look at any great mechanical invention as the summing up of the labour, the experience, the reason, and even the blunders of numerous workmen.<sup>104</sup>

Darwin puts into analogy two formative/inventive processes, by virtue of which a common historicity and the concomitant locality and

<sup>92</sup> Darwin, 1859, pp. 195, 198; 1871, I, p. 36.

<sup>93</sup> Barrett et al., 1987, N 5, p. 564 (original italic).

<sup>94</sup> Ibid., B 37, p. 180.

<sup>95</sup> Darwin, 1859, pp. 435, 206. This process of ‘reduction’ has been observed by some researchers, like Richards, 2002; Greif, 2015; Rowlinson, 2017.

<sup>96</sup> For the romantic archetype as an absolute and copula, see Schelling, 1799, SW, I, 3, pp. 63–64; 1803, SW, I, 2, pp. 66–69; 1806, SW, I, 2, p. 362.

<sup>97</sup> Owen, 1848, p. 171. For more on the shift of Owen’s theory of archetype, cf. Rupke, 2009, pp. 118–140.

<sup>98</sup> Kant, 1998[1781/1787], A642/B670-A668/B696; Kant, 2000[1790], 20: 210, 5: 182. Darwin, 1859, p. 206.

<sup>99</sup> Darwin to John Fiske (8 December [1874]); Burkhardt et al., 1985–2015, Vol. 22, p. 560.

<sup>100</sup> J. D. Hooker to Darwin (2–6 April 1845), *ibid.*, Vol. 3, pp. 167–168.

<sup>101</sup> Humboldt considers numbers as “the only remaining and widespread hieroglyphic characters of our writing [*die einzigen in unsrer Schrift übrig gebliebenen und weit verbreiteten hieroglyphischen Zeichen*]” that were born of a Pythagorean idealisation instead of a positivist designation. It is “mean numerical values” that schematise physical laws, i.e., incarnate “the constant amid changes and fleeting appearances” and thus “forces of the Cosmos”; 1845, p. 82 (my translation). Numerical determinations also lead the route to physiognomies of nature, or rather, *Naturgemälde*; see 1850, pp. 210–352. Cf. Traugott Bromme’s *Atlas zu Alex. v. Humboldt’s Kosmos* (1851) to see how numerical determinations contribute to Humboldt’s aesthetically informed, intellectual grasp of nature.

<sup>102</sup> Darwin to Frances Power Cobbe (23 March [1870?]); Burkhardt et al., 1985–2015, Vol. 18, p. 81. Also cf. *Descent*, in which Darwin pursues a naturalistic explanation of Kant’s transcendental doctrine of duty; 1871, I, pp. 70–71.

<sup>103</sup> Darwin, 1859, pp. 2, 459.

<sup>104</sup> *Ibid.*, pp. 485–486.

contingency are introduced into the coming-into-being of natural/artistic products. Thus, an alternative path alleged to explain the purposive unity of natural production is foreshadowed between a) the static structural and functional projection of a mechanical/artistic composite of different parts that are composed according to rational design, and b) the bold postulation of self-actualising immanent vitalistic or organicistic forces that concordantly operate in an inscrutable manner. Moreover, it forgoes, at least provisionally, the theological retreat to the transcendence of a supersensible craftsman-like agent, like Plato's Craftsman or William Paley's Deity, who has preordained ideas perfectly in his mind and never blunders in conferring perfection.

A similar spirit can be marked between Darwin's technological and poetical natural history and Novalis's "mathematical physiology," "anthropomorphic physics," etc.<sup>105</sup> Romanticism requires researchers themselves, as Goethe states, to "become as flexible and quick as the examples that nature gives us" so as to fully comprehend it.<sup>106</sup> For nature is the absolute activity, and "activity is only comprehensible through activity and with activity."<sup>107</sup> Besides its aesthetic and moral orientations, this comprehending activity also contains semantic and conceptual labours to designate and stay in response with the as yet silent reality. Whether spontaneous or deliberate, discursive interplays are where such labours get manifested.

Therefore, if romanticism is understood a) in terms of its poetic-speculative response to the demand of designation and determination of things whose significances are still veiled and fluid, and b) as advocating interactions between diverse discourses to sketch the new fabric of thought of reality before conceptual univocity and systematicity are attained, then there is indeed a romantic moment in Darwin's theorisation of nature. The scientific credential of this moment lies precisely in the continuous progress of indeterminate expressions towards their "plain significations," as Darwin himself promises.<sup>108</sup>

### 3.3. On the epistemic role of imagination

The concept of imagination must now be examined, as it both takes a salient place in romanticism and constitutes a faculty whose cognitive role is carefully acknowledged as indispensable yet whose scientific legitimacy always remains controversial. Therefore, for scholars against a romantic Darwin, one significant piece of evidence is his dismissal of imagination in favour of scientific reason, which is famously encapsulated in his claim that for a naturalist, his reason "ought to conquer his imagination."<sup>109</sup>

However, closer examination shows that such a quick assertion is not impartial. It takes up the literal meaning of the expression and misses what Darwin actually understands by the faculties of reason and imagination. The sentence must be situated in Darwin's address of the formation of highly perfect and complex organs by natural selection. Darwin argues that it seems unimaginable for an organ as such to be generated by numerous gradations from a rather simple form, but reason allows for the construction of its evolutionary history even though observable facts are still absent. Thus, the 'imagination' said to be conquered in fact denotes a deficient power producing hasty judgments based on orthodox beliefs and limited observations, whether it judges rationally or grasps intuitively; and 'reason', in contrast, denotes an apprehending capacity of the human mind that, despite the lack of empirical evidence, orders imperfectly given facts at disposal to hypothesise and envisage a plausible scenario. Hence, 'reason' here contains more than a discursive faculty to make determined and distinct derivations. Instead, it conforms to what

<sup>105</sup> Novalis, 2007[1798/1799], entry 420, 435. For more on Darwin's "technological view of life," see Pancaldi, 2019.

<sup>106</sup> Quoted in Nassar, 2013, p. 64.

<sup>107</sup> Novalis, 2007[1798/1799], entry 559.

<sup>108</sup> Darwin, 1859, p. 485.

<sup>109</sup> Ibid., p.188.

Darwin terms as the castle-building capacity of an inventive class, namely, the lawful use of imagination, by means of which the "real train of inventive thoughts" paves the way for new discoveries and rescues imaginative construction from lapsing into insanity.<sup>110</sup>

Thus, proponents of a romantic Darwin rightly highlight the blurring border between the two faculties of reason and imagination. Beer is subtle enough when she claims that Darwin's "appeal to reason as an authority which can take us *beyond* our imaginative limits blurs the distinction between reason and imagination even while it appears to enforce it" (Beer's *italic*). She suggests that "Darwin might equally have reversed the two terms."<sup>111</sup> To be precise, imagination occasions formative synthesis; yet it can become a constructive capacity necessary and proper to science only insofar as its involuntary movement is appropriately disciplined. In Darwin's terms, although the power of imagination is best represented by dreaming as the "involuntary art of poetry" (quoting Jean Paul Richter), its value still depends on "the number, accuracy, and clearness of our impressions; on our judgment and taste in selecting and rejecting the involuntary combinations, and to a certain extent on our power of voluntarily combining them."<sup>112</sup> Unless they inaugurate genuine inventive trains of thought, these "highly advantageous" castles built by imagination cause "severe disappointment" and should be banished.<sup>113</sup>

This idea of a disciplined productive and productive disciplined imagination finds its logically refined expressions in J. S. Mill, whose authority on logic and approval of the logical validity of the *Origin of Species* brought Darwin big relief.<sup>114</sup> According to Mill, imagination, rather than "the auxiliary merely," is "the necessary instrument of Reason."<sup>115</sup> It primarily furnishes the object of reason and affects the "soundness and comprehensiveness" of human thinking faculties.<sup>116</sup> Particularly, it functions crucially in the realm of hypothesis, although the positive truth of which must be tested by actual induction.

This understanding of imagination agrees well with Humboldt and Coleridge, Mill's romantic mentor. While foregrounding imagination as the "prime Agent of all human perception," Coleridge nevertheless holds it as retained under the "irremissive, though gentle and unnoticed, control" of the will and understanding and thus revealing itself as the faculty of reconciling "discordant qualities" *per se*.<sup>117</sup> Therefore, a genuine romantic imagination is not irrational. It is instead an "esemplastic" power to idealise and unify, methodologically progressing and thus distinct from the involuntary coalescence of sensible residues and the mechanically juxtaposing and aggregative power Coleridge termed "fancy."<sup>118</sup>

Therefore, if romantic imagination is a) understood principally in terms of the artistic composition and organic growing, whose lawful

<sup>110</sup> Barrett et al., 1987, M 33–35, p. 527.

<sup>111</sup> Beer, 2009, pp. 67–68. Out of a similar impression but in a less elaborate way, Levine suggests a more imaginative reason; Levine, 2008, p. 153.

<sup>112</sup> Darwin, 1871, I, p. 46.

<sup>113</sup> Barrett et al., 1987, M 33–35, p. 527. Bradley rightly stresses Darwin's renunciation of the imaginative dynamic of a "facile" type in favour of a rational grandeur, and notably takes this renunciation as pivotal in Darwin's conforming to the romantic sublime; Bradley, 2011.

<sup>114</sup> Darwin learned from Henry Fawcett about Mill's view on his *Origin of Species*: "he considers that your reasoning throughout is in the most exact accordance with the strict principles of Logic ... the Method of investigation you have followed is the only one proper to such a subject." (16 July [1861]); 1985–2015, Vol. 9, p. 204. He recounted Mill's comment delightedly to others, including Charles Lyell (20 July [1861]) and Asa Gray (21 July [1861]); Vol. 9, p. 212, 214. In the fifth edition of *A System of Logic* (1862), Mill further confirms Darwin's speculation on the *Origin of Species* is an "unimpeachable example of a legitimate hypothesis" (*my italic*), and it does not violate the rules of induction, because Darwin "has never pretended that his doctrine was proved. He was not bound by the rules of Induction but by those of Hypothesis"; Mill, 1862, II, p. 18.

<sup>115</sup> Mill, 1835.

<sup>116</sup> Ibid.

<sup>117</sup> Coleridge, 1817, I, p. 295; II, p. 11.

<sup>118</sup> Ibid., I, pp. 157, 282–284, 295–296.

spontaneity and infinite metamorphosis present the synthesis of the lawfulness and the freedom,<sup>119</sup> and is b) elevated to be the primordial source of all forces and faculties, comprising “reason, judgment, and power of senses” and constituting a phenomenological, sculptural power prior to any act entitled science and any product entitled knowledge,<sup>120</sup> it follows that Darwin is an alien to this original authenticity of romanticism. He never goes so far into the phenomenological and transcendental depth of imagination as into its theoretical instrumentality, just like Mill confirms. Also, Darwin is less involved in the romantic program of cultivating human sensibility and imagination than Humboldt and Coleridge. Only leaving fragments on related topics in his notebooks, Darwin occupies himself more with establishing empirical laws of change and contributing demonstrative knowledge to the edifice of natural science.

Nevertheless, it cannot be trivialised that Darwin indeed entrusts to the imagination as much an inventive task as Humboldt does. Consider Humboldt's declaration in his *Kosmos* in 1845, “the active, stimulating imagination necessary to all discoveries and creations [*die regsame, zu allem Entdecken and Schaffen notwendige und anregend Eilbildungskraft*],” together with “the reason pondering a causal connection [*die nach einem Kausal-Zusammenhang grübelnde Vernunft*]” constitutes the noble disposition [*Anlagen*] of the human mind and only their concordance captures the spirit [*Geist*] of time.<sup>121</sup> In his letter to Darwin early in 1839, Humboldt communicated emphatically this principle and attributed its proof to Erasmus Darwin, to whom both he and Darwin owed their theorisations a lot.<sup>122</sup>

Therefore, if the romantic spirit, concerning the theoretical potentiality, a) consists in enlivening the deep-seated dynamism of imagination in science, and b) this imagination, instead of being condemned as the source of illusionary phantasies and logical fallacies, acts equally authoritatively and fruitfully with reason in hypothesising and idealising and along with that offers pleasure to the judging mind, then Darwin's science is indeed shaped by this romantic spirit.

This romantic imagination presents that for which adequate concepts and empirical evidence are still absent and serves as “the authoress of voluntary forms of possible intuitions.”<sup>123</sup> It thus allows Darwin a path between the wandering fantasy and the mere mechanical juxtaposition of facts to approach in his own way the enigma of life, even though it alone promises nothing more than an idea, or a set of ideas (of natural selection). Undoubtedly, this power of imagination led to a highly speculative project that always worried Darwin.<sup>124</sup> But Darwin carried it out for it is both inevitable and worthwhile. Just as Novalis remarks, “if theory were to wait for experience it would never come about”, and when a unison of imagination, understanding, and sensibility is perfectly attained and retained, the “perfected speculation leads back to Nature.”<sup>125</sup>

Let me conclude with Darwin's explanation of the role of glacial movements in plant migration. The migrating plants are described as living waters flowing towards the equator and those surviving on

mountain-summits as the drift left by the tide in a horizontal line.<sup>126</sup> It is intriguingly remarkable that Darwin's flowing ‘living waters’ provides a poetic, empirical counterpart to Schelling's speculative idea that the productivity of nature flows like a stream and the products of nature self-sustains like whirlpools formed by this stream being inhibited.<sup>127</sup> The living waters are inhibited, challenged, and shaped by the environmental matrix to form the multiplicity of species and varieties, which in turn become part and parcel of the environmental matrix. Such a living, reciprocal whole constitutes “an entangled bank” of both natural realities and human ideas, a perfect expression used by Darwin to designate the unity discerned by him in and through multiplicity. A pleasure indeed accompanies, just as when he, in Kensington Gardens, imaged a tree as “great compound animals united by wonderful & mysterious manner.”<sup>128</sup>

#### 4. Conclusion: romantic resonance in Darwin's science

My argument suggests that Humboldt and his science cannot serve as an unproblematic, direct bridge between Darwin and romanticism. Instead, Humboldt's science itself contains a reflective vigilance towards the radical part of the romantic philosophy of nature. Further, Darwin adopted a similarly critical attitude towards Humboldt, besides his youthful zest and general admiration.

Moreover, provided that romanticism hardly constitutes a distinctly expounded doctrine to be pinned down by defining formulations and is often too easily generalised as ‘a state of mind’ or ‘an animating principle’ evoking intellectual novelty and emotional expressivity, I elucidate Darwin's romantic spirit by examining three interrelated aspects thereof. Besides, I combine this thematic examination with the discrimination between the original aspirations of early romanticism and a more moderate derived spirit emerging therefrom and with a British cast.

Consequently, I argue that Darwin incorporated the general romantic parlance and concepts and regarded them as legacies from the great philosophers and naturalists that preceded him, such as Goethe, Humboldt, Carus, and even Kant. But either his adoption often went hand in hand with significant appropriations, or this romantic bequeathal was prudently prevented from overgrowing, as early Romantics would allow as a necessary outgrowth. On the other hand, his belonging to the Victorian milieu and his exploitation of the composite discourse of Herschel, Lyell, and Malthus did not refrain him from advancing beyond them by means of both physical and intellectual circumnavigation around the globe and through history. In his naturalistic inquiry into the unity of multiple phenomena of life, Darwin explored the idea of a productive archetype in terms of descent with modification. He experimented the interplay of inchoate concepts and schemata facilitated by the disciplined productivity of imagination. He learnt from romantic poets about another kind of knowledge of nature and mind. Therefore, a romantic spirit can be observed living in Darwin's mind. It is of a historically rooted form and a sophisticatedly circumscribed type, striving to bring about new syntheses out of both the ruins of the old metaphysical and theological unity of life and the influx of new observations from around the world. Just as in Humboldt's science, it is heard in Darwin's science the resonance of romanticism, yet precisely in the sense carefully distinguished and elaborated above.

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<sup>119</sup> To illustrate the faculty of imagination and even the whole human intellect as both free and lawful by analogy with artistic composition and organic growth is characteristic of romantics, e.g., “every plant is a symbol of the intelligence [*jede Pflanze ist ein Symbol der Intelligenz*]”; Schelling, 1800, SW, I, 3, p. 490. Before Romantics, Kant already shows the lawful freedom of imagination, yet this freedom is confined to the reflecting power of aesthetic judgement distinct from the determining power of logical cognitive one; Kant, 2000[1790], 5: 240–241, 269–270. Also cf. Abrams, 1971, pp. 123–124, 167–183; Sha, 2018, pp. 6, 11–12.

<sup>120</sup> See Novalis 2007[1798/1799], entry 496, 689, 746, 775.

<sup>121</sup> Humboldt, 1845, p. 72 (my translation).

<sup>122</sup> “The poetic author of *Zoonomia* [...] proved that profound affinity with nature and an imagination that was not dreamy but powerful and productive, enlarge in superior men the realm of understanding”; Burkhardt et al., 1985–2015, Vol. 2, pp. 218–222.

<sup>123</sup> Kant, 2000[1790], 5: 240.

<sup>124</sup> Cf. Sponsel, 2018, pp. 215–223.

<sup>125</sup> Novalis, 1997[1798-1799], entry 58; 1798/1799, entry 702.

<sup>126</sup> Darwin, 1859, p. 382.

<sup>127</sup> Schelling, 1799, SW, I, 3, p. 18.

<sup>128</sup> Barrett et al., 1987, M 38–41, p. 528–529.

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None.

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