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THE CONVOLVULUS AND THE LILY

A Case-Study in the History of Reception

ABSTRACT: The intricate relationship between morphology and history plays a crucial role in Darwin's evolutionary theory since his first major work, *The Origins of the Species* (1859). The paper explores the distant roots of Darwin's reflections on rudimentary characters: a theme in which morphology and history intersect. Darwin's debate, both implicit and explicit, with his scientific interlocutors, starting from Jean-Baptiste Lamarck, led him to explain rudimentary characters on the basis of a linguistic model, which turned morphology into history: a path-breaking solution.

KEYWORDS: Robinet, Winckelmann, Lamarck, Darwin, Morphology, History.

1. In 1761 an anonymous treatise was published in Amsterdam, entitled *De la nature* (On Nature). Many conjectures were made trying to identify its anonymous author. The book was a *succès de scandale*: the year after a much shorter version of it was published in Geneva – once again, with no author's name – accompanied by a series of polemical remarks, which attacked the anonymous author for his materialism.¹ In a polemical work entitled *La nature en contraste avec la religion et la raison* (Nature Contradicting Religion and Reason) the Dominican friar Charles Louis Robert promptly identified, and denounced, the barely concealed, constant reference to Spinoza.²

The anonymous author was Jean-Baptiste Robinet, at that time 26 years old. Born in Rennes in 1735, he died in Rennes in 1820. Here I will examine only one aspect of Robinet's work: a chain of arguments paving the way to a comparison between Nature and art.³ If somebody, Robinet wrote in his *De la Nature*, argues that all natural phenomena are the outcome of a universal mechanism, one should object that “this answer would be meaningless, unless it would refer to an organic mechanism; and if this would be an organic mechanism, we assume that machines produced by an organic force are organized machines (*sont des machines organisées*)”.

¹ The preface points out that this edition includes sections from the third and fourth part of the book.

² See Bosco 2006 (a rich, although unilateral study).

³ All quotations are from the third edition, in which for the first time the author's name appeared on the front page: J.-B. Robinet, *De la Nature*, nouvelle édition, revue, augmentée et corrigée par l'auteur, Amsterdam 1766, 4 vols.

A chapter follows (ch. V), entitled: “On the difference between the productions of Nature and the works of art. Parallel between artificial machinery (*mécanique artificielle*) and organic mechanism (*mécanisme organique*).”⁴ Here is Robinet’s answer: “Art assembles, Nature organizes. Here is the distinction between the productions of the latter and the works of the former”. This should be recalled whenever fossils are compared either to inlaid works, or to an arcade, and Nature to a craftsman: “Art works cannot generate other art works; we never saw a house producing another house. Artificial machinery has not been brought to this point of perfection, and one cannot hope that this will ever be possible”.⁵ In other words – pace Aristotle, *Physics*, II, 2 – art is unable to imitate nature.

A few years later Robinet came back to the same topics in a book entitled *Vue philosophique de la gradation naturelle des formes de l’être ou les essais de la nature qui apprend à faire l’homme* (1768) (Philosophical Consideration of the Natural Gradation of the Forms of Being, or Essays of Nature Learning to Make Man). At the very beginning Robinet pointed out that “Nature is a single act, which includes all possible developments, past present and future”. The permanence of this act explains “*la durée des choses*”.⁶ The innumerable individuals scattered on the surface of earth, inside it and in the atmosphere, display mutual analogies, showing that they are infinite variations of a prototype conceived “according to a single plan (*d’après un dessein unique*)” (Robinet 1768, 3). Man is “the masterpiece of Nature” – a masterpiece which has been achieved through an innumerable series of *essais*, or “sketches (*ébauches*)”.⁷ The last word, “sketch”, is clarified in a footnote, quoting a passage from Pliny the Elder’s *Natural History* (XXI, 11):

There is a flower, not unlike the lily, produced by the plant known to us as the ‘convolvulus.’ It grows among shrubs, is totally destitute of smell, and has not the yellow antheræ of the lily within: only vying with it in its whiteness, it would almost appear to be the rough sketch made by Nature when she was learning how to make the lily (*veluti naturae rudimentum lilia facere condiscantis*).

⁴ “De la différence qu’il y a entre les productions de la Nature et les ouvrages de l’art. Parallèle de la mécanique artificielle, et du mécanisme organique” (Robinet 1766, IV, 111).

⁵ “Les ouvrages de l’art n’en produisent point se semblables: on n’a point encore vu une maison produire une autre maison: la mécanique artificielle n’a pas été portée à ce degré de perfection, et il n’est pas à espérer qu’elle le soit jamais” (*Ibid.*, IV, 113).

⁶ “La Nature n’est qu’un seul acte. Cet acte comprend les phénomènes passés, présents et futurs; sa permanence fait la durée des choses” (Robinet 1768, 2).

⁷ The same metaphor was used by Agostino Scilla in his *La vana speculazione disingannata dal senso*: “E se bene osserveremo il progetto di un Dipintore e d’uno Scultore, ci accorgeremo che da prima eglino vanno abbozzando il tutto e che gl’ultimi saranno i più vaghi e più accertati colpi; e se questo è vero, considerando le azioni del Grande Artefice Creatore che colorì per mezzo della vaga luce questo Mondo, che lo scolpì maravigliosamente con l’onnipotente sua destra, dobbiamo ammirare cotest’isola [Malta] come uno de’ colpi più riserbati al potere d’Iddio” (1996 [1670], 54).

In his early work Robinet had stressed the limits of the Aristotelian motto “art imitates nature”; now he argued that Nature behaves like an artist. How is it possible to explain this reversal?

The answer is (apparently) simple. Robinet had been inspired by Winckelmann’s *History of Ancient Art*: a work which had been published in French two years before (1766), translated by Gottfried Sellus and Robinet himself, as *Histoire de l’art chez les Anciens* (a translation which Winckelmann considered utterly inadequate: but this is a different story).⁸ From his immersion into Winckelmann’s work, which he duly mentioned, Robinet had learned that “the slow, gradual progress of Art is an imperfect image of the progress of Nature”.⁹ Careful comparison, for instance, will teach zoologists to discover that “orang-outang resembles man more than any other animal”.¹⁰

That resemblance had been explored since a long time (Tyson 1699). Robinet devoted a chapter to it, within a long sequence which included, besides the orang-outang, images of fossils evoking fragments of the human body, travellers’ accounts of mermaids and humans provided with tails, monsters and hermaphrodites. All of them were recorded as intermediary steps leading to man, the masterpiece of Nature. But even within the human kind, the trajectory towards the masterpiece had been slow. Robinet repeatedly stressed the ugliness and stupidity of African and Asian populations, turning into a racist argument Winckelmann’s bizarre hypothesis, that “perhaps” the profile the Greeks gave to their gods and goddesses, connecting brow and nose by an almost straight line, “was as peculiar to the antient Greeks, as flat noses and little eyes to the Calmucks and Chinese; a supposition which receives some strength from the large eyes of all the heads on Greek coins and gems” (Winckelmann 1765, 12-13).

The sequence “Greek god/ white European/ black African/ ape”, suggested, among others, by Robinet, was long-lasting. It became an epitome of racism, as well as an effective instrument of it. Its long-term impact is witnessed by the cover of *La difesa della razza* (ill. 1) – the Italian magazine which actively prepared and supported the racist laws introduced by the Fascist regime in 1938 – displaying a hierarchical series emphasized by the sword that cut off the alleged “inferior races”, i. e. Jews and blacks, from the white image of the Greek god. The sword unveiled the aggressive implications of the magazine’s title – “The defense of the race” – that echoed one of

⁸ À Paris chez Saillant, rue S. Jean de Beauvais, MDCCLXXVI, 2 vols. See Griener 1998, 45-46.

⁹ “Cette marche lente et graduée de l’Art est une image imparfaite de celle de la Nature” (Robinet 1768, 15; see also 12-13).

¹⁰ “Il découvrira encore que l’orang-outang ressemble plus à l’homme qu’à aucun autre animal” (*Ibid.*, 3-4).

Mussolini's bombastic mottoes: "È l'aratro che traccia il solco, è la spada che lo difende" (the plough traces the furrow, the sword defends it).¹¹



Ill. 1. *La difesa della razza I/1* (1938), cover.

2. The long-term reception of the word *ébauche*, "sketch", which Robinet used as an equivalent of Pliny's *rudimentum*, leads us in a completely different direction. The word plays a significant role in Jean-Baptiste Lamarck's *Discours préliminaire*, the inaugural speech of the Zoology course he gave in 1800 at the National Museum of Natural History in Paris. Lamarck published the speech one year after, as an introduction to his *Système des animaux sans vertèbres* (System of invertebrate animals). The classification of animals in two classes, vertebrates and invertebrates, introduced by Lamarck in that circumstance, was bound to last. Lamarck especially focused on the species placed at the bottom of the invertebrate class, and therefore of the entire animal kingdom: the octopus, "which offers, in a sense, only some sketches of animality (*n'offrant, en quelque sorte, que des ébauches d'animalité*)".¹²

Due to its simple organization, the octopus turned into a rich case study, giving to Lamarck the possibility to advance, although still in an implicit form,

¹¹ For a recent use of this kind of Fascist rhetoric see the T-shirt bearing the writing "Offence best defence" exhibited on July 31, 2018 by Matteo Salvini, at that time deputy prime minister of Italy: https://www.repubblica.it/politica/2018/07/30/news/salvini_maglietta_t-shirt_destra-202988063/

¹² "Vous verrez que les polypes qui forment la dernière classe des animaux sans vertèbres et par conséquent de tout le règne animal, et que ceux surtout que comprend le dernier ordre de cette classe, n'offrant en quelque sorte que des ébauches de l'animalité" (Lamarck 1801, 18-19).

his hypothesis about the relationship between the features of animal species and the context in which they live:

We can find among octopus the unknown boundary of the animal ladder, i. e. the sketches of animalisation (*les ébauches de l'animalisation*) that nature easily forms and multiplies if the circumstances are favourable, but that nature can easily and quickly destroy if the circumstances that made their existence possible would change.¹³

In his *Philosophie Zoologique*, published in 1809, Lamarck developed this argument, on the one hand describing the variety of natural forms according to their growing complexity, on the other stressing the role played by circumstances in shaping the form and organizations of animals (Lamarck 1830, I, 231 ff.).

3. Pliny's *rudimentum*, first translated as "ébauche" (sketch) in Robinet's comment, was then reworked by Lamarck. Both Robinet and Lamarck – and, of course, Pliny – were well known to Charles Darwin. The pages of *The Origin of Species* devoted to "rudimentary organs" are also very well-known – although, if I am not mistaken, the trajectory I am suggesting throws an unexpected light on them.

Darwin's argument on natural selection implied a rejection of the perspective, advanced among others by Robinet and Lamarck, positing the existence of a gradation of the natural species, based on their growing complexity, i. e. advance in organisation.

"Natural Selection", Darwin objected,

acts exclusively by the preservation and accumulation of variations, which are beneficial under the organic and inorganic conditions to which each creature is exposed at all periods of life. The ultimate result is that each creature tends to become more and more improved in relation to its conditions. This improvement inevitably leads to the gradual advancement of the organisation of the greater number of living beings throughout the world. But here we enter on a very intricate subject, for naturalists have not defined to each other's satisfaction what is meant by an advance in organisation."

Darwin exemplified this ambiguity focusing on a few perplexing cases, and then added: "it is quite possible for natural selection gradually to fit a being to a situation in which several organs would be superfluous or useless: in such cases there would be retrogression in the scale of organisation."

Darwin addressed this "retrogression" twice. First, on a general level:

¹³ "Ils [les Polypes] présentent enfin le dernier des échelons qu'on a pu remarquer dans ce règne intéressant, et c'est parmi eux que se trouve le terme inconnu de l'échelle animale, en un mot les ébauches de l'animalisation que la nature forme et multiplie avec tant de facilité dans les circonstances favorables; mais aussi qu'elle détruit si facilement et si promptement par la simple mutation des circonstances propres à leur donner l'existence" (*Ibid.*, 41).

But it may be objected that if all organic beings thus tend to rise in the scale, how is it that throughout the world a multitude of the lowest forms still exist; and how is it that in each great class some forms are far more highly developed than others? Why have not the more highly developed forms everywhere supplanted and exterminated the lower? Lamarck, who believed in an innate and inevitable tendency towards perfection in all organic beings, seems to have felt this difficulty so strongly, that he was led to suppose that new and simple forms are continually being produced by spontaneous generation. Science has not as yet proved the truth of this belief, whatever the future may reveal. (Darwin 1909 [1859], 134)

Then, at the end of *The Origin of Species*, the issue of “superfluous or useless organs” re-emerged:

Organs or parts in this strange condition, bearing the plain stamp of inutility, are extremely common, or even general, throughout nature. It would be impossible to name one of the higher animals in which some part or other is not in a rudimentary condition. In the mammalia, for instance, the males possess rudimentary mammae.

Once again, Darwin’s main interlocutor (this time, unnamed) was Lamarck, who in his *Philosophie Zoologique* had argued that “the lack of use of an organ, reinforced by habitudes, leads to the organ’s gradual impoverishment, and ultimate disappearance, to the point of turning it into nothing”.¹⁴ Darwin conceded that

It appears probable that disuse has been the main agent in rendering orders rudimentary. It would at first lead by slow steps to the more and more complete reduction of a part, and at last become rudimentary - as in the case of the eyes of animals inhabiting dark caverns, and of the wings of birds inhabiting oceanic islands, which have seldom been forced by beasts of prey to take flight, and have ultimately lost the power of flying. (Darwin 1909 [1859], 494-495)

In his *Evolution, Old and New* (1879) Samuel Butler, the author of *Erewhon*, commented at length on these passages. On the one hand he stressed Darwin’s contiguity with Lamarck, on the other opposed Lamarck’s “simple, straightforward language” to Darwin’s unclear argument based on natural selection (Butler 1879, 345 ff., especially 378).¹⁵ Lamarck, who, following Robinet, had reworked the personification of Nature provided by Pliny into a different (but still teleological) trajectory, had interpreted rudimentary organs as the long-term outcome of their misuse. In his concluding remarks on this issue Darwin looked at rudimentary organs as a clue – *un indizio* – of “a former state of things”:

¹⁴ “Le défaut d’emploi d’un organe, devenu constant par les habitudes qu’il a prises, appauvrit graduellement cet organe, et finit par le faire disparaître, et même l’anéantir” (Lamarck 1830, I, 240; author’s italics).

¹⁵ See Grignolio and Fortunati 2009, 81-103.

Finally, as rudimentary organs, by whatever steps they may have been degraded into their present useless condition, are the record of a former state of things, and have been retained solely through the power of inheritance, – we can understand, on the genealogical view of classification, how it is that systematists, in placing organisms in their proper places in the natural system, have often found rudimentary parts as useful as, or even sometimes more useful than, parts of high physiological importance. Rudimentary organs may be compared with the letters in a word, still retained in the spelling, but become useless in the pronunciation, but which serve as a clue for its derivation. (Darwin 1909 [1859], 496)

The whole page is striking – but the last sentence even more so. In his book *The Structure of Evolutionary Theory*, Stephen Jay Gould quoted it, but without comment (2002, 112).¹⁶ I will have a closer look at it, asking the following questions: a) what inspired Darwin to advance such a comparison? b) what did the comparison imply?

4. Darwin's remark inevitably recalls the famous passage in Galileo's *Saggiatore*:

Philosophy is written in this vast book, which continuously lies open before our eyes (I mean the universe). But it cannot be understood unless you have first learned to understand the language and recognize the characters in which it is written. It is written in the language of mathematics, and the characters are triangles, circles, and other geometrical figures. Without such means, it is impossible for us humans to understand a word of it.¹⁷

Darwin may have also thought of this passage. But instead of arguing, as Galileo did, that the book of nature is written in the unchanging language of mathematics, Darwin compared rudimentary organs to “the letters in a word” written in an alphabetical language, pointing at the gap between its (more conservative) spelling and its pronunciation, as a clue which could give access to a “former state of things”. Darwin, I would suggest, might have been inspired – somewhat paradoxically, as we will see – by an etymological dictionary, published in 1783 by the Reverend George William Lemon. Here is its full title: *English Etymology, or, a Derivative Dictionary of the English Language, in Two Alphabets, Tracing the Etymology of those English Words that are Derived I, From the Greek, and Latin Tongue; II, From the Saxon, and Other Northern Tongues*.

¹⁶ The last sentence is translated by Canestrini 1925 [1877], 247.

¹⁷ “La filosofia è scritta in questo grandissimo libro che continuamente ci sta aperto dinanzi agli occhi (io dico l’universo), ma non si può intendere se prima non s’impara a intender la lingua, e conoscere i caratteri ne’ quali è scritto. Egli è scritto in lingua matematica, e i caratteri son triangoli, cerchi, ed altre figure geometriche, senza i quali mezzi è impossibile a intenderne umanamente parola.” (Galilei 1965 [1623], 38).

The reason which pushed me to advance this hypothesis is twofold. First of all, Lemon's introduction to his own dictionary; second, the content of the dictionary itself. The introduction begins as follows:

Words are the elementary and constituent part of every language, made use by every nation on the face of the globe, both barbarous and polite, to express their various ideas to each other, and give names and appellations to the different objects around them.

Then, unpredictably, the Reverend goes on:

Nay, even in the *Vegetable* race, tho' not indued with the powers of utterance and articulation, yet even in them are to be found the wonderful powers of communicating their different affections and influences to each other; for we often find in plants and flowers a sympathy and antipathy, working by internal influence; as may be observed in that most amazing plant called *the Sensitive*, to whatever cause it may be owing; which has been placed as it were by Providence in a middle scale of existence, between plants and animals; superior indeed to the former, but inferior to the latter: some *Trees* and *Shrubs* likewise seem to declare a mutual love and affection for each other; else, why does the vine so cordially embrace her elm; and why do the ivy and the eglantine so eagerly enclasp their oak? – others again, express a horror and detestation in their growth, when planted in the neighbourhood of obnoxious society; else, why does the olive-tree detest the yew; and why the pear, the pine? is it not because the former enjoy the kind and friendly support, while the latter avoid and shun the baleful influence? (Lemon 1783, i)

The Loves of the Plants, the famous poem written by Erasmus Darwin, Charles's grandfather, came out in 1789, as the second part of *The Botanical Garden*; it was immediately reprinted and translated into several languages. Erasmus Darwin reworked in an anthropomorphic vein Linnaeus's emphasis on the sexual life of plants – a dimension which had been deliberately avoided by William Withering in his *A Botanical Arrangement of all the Vegetables Naturally Growing in Great Britain* (1776).¹⁸ The possibility that Erasmus Darwin had come across George William Lemon's preface to *English Etymology*, published six years before *The Loves of the Plants*, does not seem far-fetched. But Charles, who shared his grandfather's fascination for botany, might have also consulted Lemon's *English Etymology*, making an unpredictable use of it.

5. The title of the latter's introduction – "Preface in Defence of the English Language, and the Use of Etymology" – paves the way to a polemical argument:

Another great use of etymology is that it will serve to fix the *orthography*, or a true method of writing every word, by keeping as near as possible to the original, without deviating too far from the general method that has prevailed thro' custom.

¹⁸ See King-Hele 1977, 103.

The “original”, i. e. the Greek and Latin etymology, has been polluted along the centuries, mostly by the French:

For while we have so many words in our language derived to us from the antient Franco-Gallic, and the modern French; and so long as we will servilely continue to copy their manner of writing those words, we must be wrong, for there are no people in Europe who have deviated more from the Greek and Roman writers in their manner of orthography than the Gallic nations. (Lemon 1783, xxxvii-xxxviii)

George William Lemon, never tired of attacking the French, “those debasers of all language”, looked obsessively for Greek etymologies, turning into a caricature a suggestion put forward by Meric Casaubon.¹⁹ The entry “Air” shows the connection between the two attitudes, and their absurd outcome:

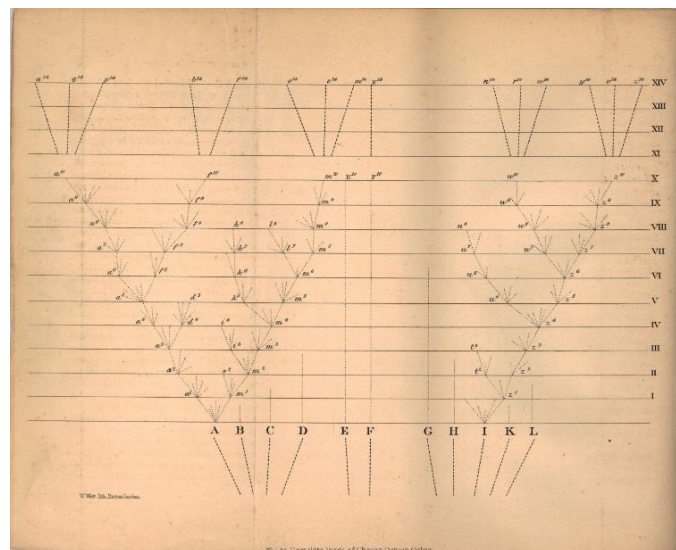
AIR, or manner; by the help of our very good friends the French, this word is so changed in appearance, that no wonder our dictionary writers and etymologists should be so perplexed in explaining, and tracing its derivation.

Rejecting the argument put forward by previous etymologist, who connected “air” in the sense of “symmetry, grace” to the French word *air*, and therefore to the Latin *aer*, Lemon offered “another conjecture; that *air*, when it signifies *manner, grace, and dignity*, or even any of their contraries, may be derived by *arete, virtus, gratia, modus; a grace, manner, or mode of action*”.

6. Lemon was convinced that the orthography of English words should be corrected, in order to make it closer to “the original”, i. e. their alleged (mostly Greek) etymology – although in the case of “air” he refrained from making definite suggestions. Darwin started from the opposite assumption: that the spelling (i. e. the orthography) of a word kept a trace, notwithstanding its changing pronunciation, of a former state of the language. (In the case of “air”, both the English and French pronunciations conceal the Latin etymology, “*aer*”). Likewise, the “rudimentary organs”, Darwin argued, would “serve as a clue for its derivation” – a possible echo of the title of Lemon’s work: *English Etymology, or, a Derivative Dictionary of the English Language*.

Although the divergence between Lemon’s and Darwin’s respective approaches is blatant, both relied upon a genealogical model of transmission inspired by philology.

¹⁹ Lemon 1783, entry “Pudding”; Casaubon 1650, 378: “Ut dicam libere, quod sentio: pauca puto vere et genuine Anglica, sive Saxonica, id est vetera reperiri, quae (iis exceptis, quae Latinae sunt originis) si rite et diligenter expendantur, non possint ad Grecos fontes revocari” (quoted by Lemon 1783, xxx).



Ill. 1. Charles Darwin, *On the Origin of Species* (1859), chap. IV.

This model inspired the diagram included, and commented, in the fourth chapter of *The Origin of Species* (ill. 2), which Darwin used to exemplify the “principle of great benefit being derived from divergence of character, combined with the principles of natural selection and of extinction”.²⁰ Significantly, in a further section of *The Origin*, devoted to the principles of classification, Darwin put forward the following example:

It may be worth while to illustrate this view of classification, by taking the case of languages. If we possessed a perfect pedigree of mankind, a genealogical arrangement of the races of man would afford the best classification of the various languages now spoken throughout the world; and if all extinct languages, and all intermediate and slowly changing dialects, were to be included, such an arrangement would be the only possible one. (Darwin 1909 [1859], 459)

7. Looking for fragments incrustated in the present, turning them into clues which would give access to the past: this is what philology often does, metaphorically. This is also what geology does, in a literal sense. Not by chance, in his *Textkritik* Paul Maas, the great philologist, relied upon *Leitfehler*, “errores significativi”, a category shaped on *Leitfossilien*, index fossils, as an interpretive tool (2017, 61 ff.). Not by chance Charles Darwin looked as a models at Charles Lyell, the great geologist, and to his grandfather, Erasmus Darwin, interpreting “rudimentary structures” as clues of a common descent (Butler 1879, 38). Darwin turned morphology into history: a reversal of the trajectory that Pliny ascribed to Nature, describing the convolvulus as a *rudimentum* to make the lily.

²⁰ See Darwin 1859, between pp. 116 and 117. The diagram (still present in the 4th ed., London 1866) disappeared in the later editions I have been able to consult.

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