

# Searching and Classifying. Universal Taxonomy of Carolus Linnaeus and Mathesis Universalis of Leibniz are the Ground of Michel Foucault's Conception of 'Episteme'

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Текстът обсъжда Линеевата класификационна схема и идеята за универсално изчисление на Лайбниц в основата на понятието „епистема“ на френския философ Мишел Фуко, както и връзката на представата за универсален ред с възгледи на Декарт („Правила за ръководство на ума“) и Кант („Критика на чистия разум“, „Критика на способността за съждение“).

'Episteme' designates the accepted mode of creating and ordering knowledge in a given period (e.g. 18<sup>th</sup> century). Several discourses can coalesce into such an episteme, which assure some their coherence within an underlying structure of hidden principles about what is knowledge in the considered period. The term has been coined by the French philosopher Michel Foucault, *Les mots et les choses*<sup>1</sup>.

Foucault attempted to show that and how an episteme based on resemblances and analogies had superseded in the 17<sup>th</sup> century by a new episteme of identities and distinctions. The 19<sup>th</sup> century instituted a further episteme of historical evolution. He disputed Leibniz' idea of 'mathesis universalis' and 'characteristica universalis' – a project of a general science of order, a theory of sign analyzing the way for anything to be represented.

All the Chapter 5, „Classifying“ of *Les Mots et les choses* is based on two main papers of Carolus Linnaeus: *Systema naturae*<sup>2</sup>, and especially *Philosophie botanique*<sup>3</sup>. Thereby roughly, the extensive network of empirical knowledge was outlined: that of non-quantitative orderings. Maybe a distant, but persistent unity of a universal taxonomy would be prominent for the entire clearness after Linnaeus, when he suggested that he would bring to light one and the same distribution, one and the same order in any concrete domains of nature and society.

<sup>1</sup> Paris. Gallimard, 1966 (English translation: *The Order of Things*; Bulgarian edition: „Думите и нещата“, „Наука и изкуство“, София 1990).

<sup>2</sup> [http://www.fh-augsburg.de/%7Eharsch/Chronologia/Lspost18/Linne/lin\\_syns.html](http://www.fh-augsburg.de/%7Eharsch/Chronologia/Lspost18/Linne/lin_syns.html).

<sup>3</sup> <http://botanicallatin.org/philbot/pblect.html>.

A paragraph, „«Mathesis“ et „taxinomia““ of that chapter, is devoted to a 'general science of the order':

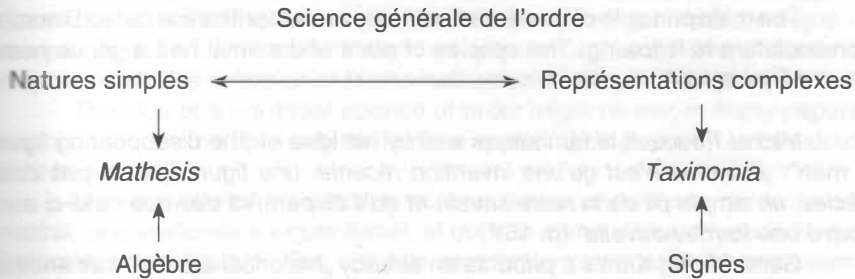


Table 1.<sup>4</sup>

“Ce qui rend possible l'ensemble de l'*épistémè* classique, c'est d'abord le rapport à une connaissance de l'ordre. Lorsqu'il s'agit d'ordonner les natures simples, on a recours à une mathesis dont la méthode universelle est l'Algebre.<sup>45</sup>

“Lorsqu'il s'agit de mettre en ordre des natures complexes (les représentations en général, telles qu'elles sont données dans l'expérience), il faut constituer une taxinomia et pour ce faire instaurer un système de signes.<sup>46</sup>

Linnaeus is credited with setting up the hierarchical structure of classification based upon observable characteristics. While the underlying details concerning what are reckoned to be scientifically relevant as visible or at least observable signs or features has changed with developing cognition, the fundamental principles continue to be solid. In *Systema naturae* (1735) he presented his classification of plants, animals, and minerals, and in *Genera plantarum*<sup>7</sup> (1737) he explained his system for classifying plants largely on the basis of the number of stamens and pistils in the flower. His classification has remained the basis of modern taxonomy: botanists acceded in 1905 to establish

<sup>4</sup> M. Foucault. Les mots et les choses. Paris: Gallimard, 1966, p. 87.

<sup>5</sup> M. Foucault. Les mots et les choses. Paris: Gallimard, 1966, p. 86. „What makes the totality of the Classical *episteme* possible is primarily the relation to a knowledge of order. When dealing with the ordering of simple natures, one has recourse to a mathesis, of which the universal method is algebra“ (Foucault, M. The Order of Things. An Archaeology of the Human sciences. Vintage Books Edition. New York, 1994, p. 71, [http://www.illogicaloperation.com/textz/foucault\\_michel\\_the\\_order\\_of\\_things.htm](http://www.illogicaloperation.com/textz/foucault_michel_the_order_of_things.htm)).

<sup>6</sup> M. Foucault. Les mots et les choses. Paris: Gallimard, 1966, p. 86. „When dealing with the ordering of complex natures (representations in general, as they are given in experience), one has to constitute a *taxinomia*, and to do that one has to establish a system of signs. These signs are to the order of composite natures what algebra is to the order of simple natures.“ (Foucault, M. The Order of Things. An Archaeology of the Human sciences. Vintage Books Edition. New York, 1994, p. 71, [http://www.illogicaloperation.com/textz/foucault\\_michel\\_the\\_order\\_of\\_things.htm](http://www.illogicaloperation.com/textz/foucault_michel_the_order_of_things.htm)).

<sup>7</sup> *Genera plantarum, eorumque characteres naturales secundum numerum, figuram, situm & proportionem omnium fructificationis partium.*

his „Species plantarum“<sup>8</sup> (2 vols., 1753) and zoologists the tenth edition of his „Systema naturae“ (1758) as the official starting points for scientific names of plants and animals.

The main principle of Linnaeus taxonomy and classification called Binomial Nomenclature is following. The species of plant and animal had a genus name ensued by a specific name.

Michel Foucault is famous as well by his idea of „the disappearing figure of man“: „*l'homme n'est qu'une invention récente, une figure qui n'a pas deux siècles, un simple pli dans notre savoir, et qu'il disparaîtra dès que celui-ci aura trouvé une forme nouvelle*“ (p. 15)<sup>9</sup>.

Generalizing Kant's *a priori* as an already „historical *a priori*“ was another leading for him conception:

“*A partir de quel a priori historique a-t-il été possible de définir le grand damier des identités distinctes qui s'établit sur le fond brouillé, indéfini, sans visage et comme indifférent, des différences?*“ (p. 15)<sup>10</sup>.

His book starts by a detailed explanation of Velasquez' „Las Meninas“ (1656), serving as an original „painting motto“ of „Les mots et les choses“, but I would like to suggest **another interpretation** of that so famous beginning:

The painter representing „*les mots et les choses*“, or „the words and the things“, and their connection, namely „the order of things“, was as the hidden, invisible as the real focus of the canvas, and what is more, he had depicted himself, the depicter, the hidden focus ... just as a leaving person, formally in the background, but the true light center of the painting.

### **Scholia:**

The representing, depicting, classifying, creating the dictionary of „*les mots et les choses*“, in our case –*Linnaeus*, was who hid himself ... into his creation. By *analogia entis*, we after Linnaeus might suggest, that the Creator of Nature has hidden Himself in some natural things in such a way to have ordered the living beings as Their Real Focus (and hopefully, to have allowed for His Creation to be classified by us, people).

The Creator of Nature (and in particular, of organisms) was „natural“ to have hidden Himself in the „creative“, i.e. reproductive organs, and by which to permit for Linnaeus to classify all the plants.

Tracing the basic idea of a universal science of order after Descartes, Leibniz, and Kant is very instructive:

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<sup>8</sup> Species plantarum, exhibentes plantas rite cognitatas, ad genera relatas, cum differentia specificis, nominibus trivialibus, synonymis selectis, locis natalibus, secundum systema sexualis digestas

<sup>9</sup> „...man is only a recent invention, a figure not yet two centuries old, a new wrinkle in our knowledge, and that he will disappear again as soon as that knowledge has discovered a new form“ (p. xxii). [http://www.illogicaloperation.com/textz/foucault\\_michel\\_the\\_order\\_of\\_things.htm](http://www.illogicaloperation.com/textz/foucault_michel_the_order_of_things.htm)

<sup>10</sup> „What historical *a priori* provided the starting-point from which it was possible to define the great checkerboard of distinct identities established against the confused, undefined, faceless, and, as it were, indifferent background of differences?“ (p. xxiii). [http://www.illogicaloperation.com/textz/foucault\\_michel\\_the\\_order\\_of\\_things.htm](http://www.illogicaloperation.com/textz/foucault_michel_the_order_of_things.htm)

*Regulæ ad directionem ingenii* of Descartes (in the penultimate paragraph of Rule IV) says: „ac proinde generalem quandam esse debere scientiam, quæ id omne explicet, quod circa ordinem et mensuram nulli speciali materiae addictas quaeri potest, eandemque, non ascitio vocabulo, sed jam veterato atque usu recepto, Mathesim universalem nominari, quoniam in hac continetur illud omne, propter quod aliae scientiæ et Mathematicæ partes appellantur.“<sup>11</sup>

The idea of a universal science of order might be met in many papers of Leibniz. Let us remember only the famous appeal: *Calculemus!* (Let us calculate for it to dispute!):

“Itaque profertur hic calculus quidam novus et mirificus, qui in omnibus nostris ratiocinationibus locum habet, et qui non minus accurate procedit, quam Arithmetica aut Algebra. Quo adhibito semper terminari possunt controversiæ quantum ex datis eas determinari possibile est, manu tantum ad calamum admota; ut sufficiat duos disputantes omissis verborum concertationibus sibi invicem dicere: *c a l c u l e m u s*.”<sup>12</sup>

Leibniz wrote as well of *initia scientiæ generalis* (principles of universal science), among which is universal mathematics:

#### INITIA SCIENTIÆ GENERALIS. CONSPECTUS SPECIMINUM

“I. *Mathematica Generalis, de Magnitudine sive Quantitate, et Similitudine 15 sive qualitate, determinandis, qua Numerorum tam certorum quos Arithmetica tradit, quam incertorum quibus Algebra occupatur, calculus omnis novis artibus perficitur, absolvunturque quæ hactenus visa non sunt in potestate.*“<sup>13</sup>

Eternal Truth, Art of Discovery, and an Encyclopedia of all the human knowledge, or *an accession book for it to be classified*, are the consecutive books of his basic idea:

#### “Pars I. Initia Scientiæ Generalis

<sup>11</sup> <http://pedagogie.ac-toulouse.fr/philosophie/descregulae.htm>: „there must be some general science to explain everything which can be asked concerning measure and order not predicated of any special subject matter. This, I perceived, was called „Universal Mathematics“, not a far fetched designation, but one of long standing which has passed into current use, because in this science is contained everything on account of which others are called parts of mathematics.“ – Cit. in, and more about *Mathesis Universalis* after Descartes in: John A. Schuster. *Descartes' Mathesis Universalis*: 1619–28. – In: *Descartes: Philosophy, Mathematics and Physics*, The Harvester Press. Sussex Burnes & Noble books. New Jersey, 1980, pp. 41–96.

<sup>12</sup> Synopsis libri cui titulus er it: Initia et Specimina Scientiæ novæ Generalis pro Instauratione et Augmentis Scientiarum ad publicam felicitatem (<http://www.uni-muenster.de/Leibniz> – BandVI4 – TeilbandA: Seite 1–509, S. 443.) „There is delivered a certain new and wonderful calculation, which has relation to all our reflections and which is proceeded not less accurate than Arithmetic and Algebra. As applied to controversions, they can terminate always as they are soluble on data just by putting pen to paper; it is sufficient for two disputers omitting verbal pleadings to say each other: let us *c a l c u l a t e*.“

<sup>13</sup> (<http://www.uni-muenster.de/Leibniz> – BandVI4 – TeilbandA: Seite 1–509, S. 362.) **Elements of Universal Science. An approximate view:** „I. Universal mathematics for magnitudes, or quantities, and similarities, or qualities, to be determined: all the calculations realize by new methods by numbers as fixed, which arithmetic studies, as indefinite, which algebra studies, and by which what seems hitherto impossible resolves.“

Lib. I. *Elementa Veritatis aeternae*, seu de forma argumentandi qua permodum calculi omnes controversiae demonstrative tollantur ...

Lib. II. *De Arte Inveniendi* ...

Lib. III. *Consilium de Encyclopaedia condenda, vel Inventario cognitionis humanae condendo* ...<sup>14</sup>.

“Keime“ and „Anlage“ after Kant (Ph. Sloan about „the biological roots of Kant’s a priori“)<sup>15</sup>.

According to Ph. Sloan, „the terms *Keime*, commonly rendered in English translations as „seed“, but which I consider best rendered within its historical context by term „germ“, and *Anlage*, usually translated as „disposition“, „predisposition“, „aptitude“, or „capacity“. I have settled on the term „predisposition“ as the best contextualized rendition.“<sup>16</sup> The connection between *Keime* and *Anlage* – that biological metaphor, which we may find as after Kant as after Foucault, in the ground of a *priori* – is watched in **Kant’s *Kritik der reinen Vernunft***:

„Wir werden also die reinen Begriffe bis zu ihren ersten Keimen und Anlagen im menschlichen Verstande verfolgen, in denen sie vorbereitet liegen, bis sie endlich bei Gelegenheit der Erfahrung entwickelt und durch ebendenselben Verstand, von den ihnen anhängenden empirischen Bedingungen befreit, in ihrer Lauterkeit dargestellt werden.“<sup>17</sup>

Kant spoke as well of an „epigenesis“ of pure reason:

“Folglich bleibt nur das zweite übrig (gleichsam ein System der Epigenesis der reinen Vernunft): daß nämlich die Kategorien von seiten des Verstandes die Gründe der Möglichkeit aller Erfahrung überhaupt enthalten.“<sup>18</sup>

According to Kant’s ***Kritik der Urteilskraft***, the theory of epigenesis considered nature not only as developing, but also as self-generative nature:

“Wenn man dagegen an dem Verteidiger der Epigenesis den großen Vorzug, den er in Ansehung der Erfahrungsgründe zum Beweise seiner Theorie vor dem ersteren hat, gleich nicht kenne: so würde die Vernunft doch schon vor voraus für seine Erklärungsart mit vorzüglicher Gunst eingenommen sein, weil sie die Natur in Ansehung der Dinge, welche man ursprünglich nur nach der Kausalität der Zwecke

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<sup>14</sup> (<http://www.uni-muenster.de/Leibniz> – BandVI4 – Teilband A: Seite 1–509, S. 359–360.) „**Part I. Principles of Universal Science.** Book 1. The elements of eternal verity ... all the controversies settle by means of calculations... Book 2. The art of discovery ... Book 3. A plan for Encyclopedia, for an accession book of human knowledge to be created ...“

<sup>15</sup> Dimitrov, I. *Imagination and Cognition (Kant’s Heuristics)*. Univ. Diss., Sofia, 2003, pp.182–185.

<sup>16</sup> Sloan, Ph. *Preforming the Categories: Eighteenth-Century Generation. Theory and Biological Roots of Kant’s A Priori*. – In: *Journal of the History of Philosophy*, vol. 40 (2002), No. 2, pp. 229–253: p. 232.

<sup>17</sup> ([http://www.ilt.columbia.edu/academic/digitexts/kant/pure\\_reason/pure\\_reason.txt](http://www.ilt.columbia.edu/academic/digitexts/kant/pure_reason/pure_reason.txt), translated by J. M. D. Meiklejohn:) „We shall therefore follow up the pure conceptions even to their germs and beginnings in the human understanding, in which they lie, until they are developed on occasions presented by experience, and, freed by the same understanding from the empirical conditions attaching to them, are set forth in their unalloyed purity.“

<sup>18</sup> ([http://www.ilt.columbia.edu/academic/digitexts/kant/pure\\_reason/pure\\_reason.txt](http://www.ilt.columbia.edu/academic/digitexts/kant/pure_reason/pure_reason.txt), translated by J. M. D. Meiklejohn) „Consequently, nothing remains but to adopt the second alternative (which presents us with a system, as it were, of the epigenesis of pure reason), namely, that on the part of the understanding the categories do contain the grounds of the possibility of all experience.“

sich als möglich vorstellen kann doch wenigstens, was die Fortpflanzung betrifft, als selbst hervor-bringend, nicht bloß als entwickelnd, betrachtet ...<sup>19</sup>

In Kant's *Kritik der reinen Vernunft*, the following significant passage is found (transl. by Ph. Sloan):

"The foundations [*Gründe*] which lie in the nature of organic body (plant or animal) for a determinate unfolding [*bestimten Auswicklung*] are called germs [*Keime*] when this unfolding affects specific parts. But when it affects only the size or the relations of the parts to one another, I call them natural predispositions [*natürliche Anlagen*]. ... In birds of the same species, which happen to live in different climates, lie germs for the unfolding of a new layer of features, if they live in cold climates, which will be surprised when they reside in temperature [climates] ... Chance or general mechanical laws [*algemeine mechanische Gesetze*] cannot bring being forth such adaptations. There by we must consider such opportunistic unfolding [*Auswickelungen*] as preformed [*vorgebildet*]. Even then, where nothing purposive is displayed, the bare capacity [*vermögen*] to propagate its special acquired character is already demonstration enough that a particular germ or natural predisposition [*Keime oder natürliche Anlagen*] for it has been discovered in organic creation."<sup>20</sup>

### Conclusion:

The 18<sup>th</sup> century, the century of Linnaeus, passed under the sign of classification. It was sanctioned by a leaving His Creation Creator, however yet remaining the focus of things, the order of thing as a specific part of the world allowing for people to classify all the plants and animals...

Two centuries later, Michel Foucault attempted to classify analogically all the knowledge not by its correspondence to things, but by its coherence with itself. The hidden focus of his notion of „epistema“, of that coherence of words with themselves, turned out Linnaeus' principle of classification...

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<sup>19</sup> „If, on the contrary, man would not recognize the essential advantage of the defender of epigenesis, which he has over the first in relation to the empirical foundations of the proof of his theory, reason would favour to his way of explanation yet preliminary, since nature is considered by this theory at least as to reproduction on account of things, which man can represent initially as possible only in according to the causality of purposes, rather as a self-generative than only as a developing nature...“

<sup>20</sup> Kant, I. *Kritik der reinen Vernunft*. Hamburg: Meiner, 1980, S. 433–435 (editor: Jens Timmerman). Cit. in: Sloan, Ph. *Preforming the Categories: Eighteenth-Century Generation. Theory and Biological Roots of Kant's A Priori*. – In: *Journal of the History of Philosophy*, vol. 40 (2002), No. 2, pp. 229–253: p. 240.