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## FRANCIS BACON'S NATURAL PHILOSOPHY AS A UNIVERSAL LANGUAGE

*Sola perpetuo manent  
Subiecta nulli, mentis atque animi bona  
Florem decoris singuli carpunt dies...*

Seneca

*The liberty of man consists lies solely in this:  
that he obeys natural laws because  
he has "himself" recognised them as such,  
and not because they have been externally imposed  
upon him by any extrinsic will whatever,  
divine or human, collective or individual...*

Michail Bakunin

Disputes over the power of word were a commonplace in the seventeenth century. Numerous political affairs, economic stagnation, and religious disagreements taking place in Europe interwove in what has come to be regarded as "the crisis of the seventeenth century"<sup>1</sup>. Naturally, prominent thinkers of the century devoted their minds to the search for a universal remedy for the crisis. Consequently, to a large and surprising extent, an intense course of history in the seventeenth-century Europe led towards a detailed preoccupation with the power of word bringing to memory the myth of the Adamic language with all its blessings.

Bruno Latour calls contemporary scientists "the tribe of readers and writers"<sup>2</sup>. If he is right, then that tribe certainly has its origins in the persona of Francis Bacon who perfected and highlighted both arts of reading and writing all his life. In his philosophical program there remains the issue of language which Bacon sees as of high importance on the way to the

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<sup>1</sup> See T. Munck, *Seventeenth-Century Europe: State, Conflict, and the Social Order in Europe, 1598-1700*, The Macmillan Press Ltd, New York and London, 1990, pp. 83-84.

<sup>2</sup> B. Latour and S. Woolgar, *Laboratory Life: The Social Construction of Scientific Facts*, Beverly Hills, California, Sage, 1979, p. 69.

clear perception of things. For him, a language, as every product of the human mind, succumbs to the fallacy of human thinking and therefore needs a thorough cleansing. He would certainly have agreed with Huxley's statement: "A man who habitually writes and speaks correctly is one who has cured himself, not merely of conscious and deliberate lying, but also (and the task is much more difficult and at least as important) of unconscious mendacity"<sup>3</sup>.

In the light of the seventeenth-century belief in the magic power of word, a case of Francis Bacon's natural philosophy deserves a special consideration. Facing a political crisis in the monarchy, he eagerly grasped at the opportunity to exploit language in terms of a universal remedy for all evils in the state. Therefore, "[...] the new philosophy of Bacon [...] emerges against specific circumstances of the country's pursuit of a universal language"<sup>4</sup>. His natural philosophy and critique of language derived from his mistrust of the scholastic philosophy after indicating its failure to see the dawn of the new science with its new aims and needs.

Not only did Bacon see a need to instaurate the science, but he also saw that instauration as a means to prop the model of a perfect state on. In the course of his philosophical program, Francis Bacon clearly realized that language was its integral part because of its capability of being either an aid or an obstacle in the process of human perception of the real world. Being corrupted mostly by the idol of the market place, language as seen by Bacon was a kind of sponge constantly absorbing ambiguity and vagueness of the thinking processes governed mostly by motions of desire.

In other words, language was a mirror reflecting the imperfect reality with its errors. Just as scholastic philosophy, erroneous in its aspects, language needed a catharsis on which both political harmony and further scientific progress depended. Therefore, Bacon's program of natural philosophy based on the inductive method presupposed a thorough cleansing of the human fallacies present in language, which would consequently lead towards achieving power over nature, which, in turn, would give a key to the natural harmony in the state and science.

Bacon's desire to achieve power over nature remained in accordance with the general goal of the Renaissance movement, which among other

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<sup>3</sup> A. Huxley, *Words and Their Meanings*, in "The Importance of Language," (ed.) M. Black, Prentice-Hall Inc., Englewood Cliffs, N. J., 1962, p. 1.

<sup>4</sup> R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, London: Associated University Press, London, 1995, p. 263.

aims also presupposed a victory over nature<sup>5</sup>. In his book entitled “Francis Bacon: From Magic to Science” Paolo Rossi discusses the Renaissance tradition of alchemy, astrology, and hermeticism as a prologue to the new philosophy, mentioning Bacon’s desire for experimental works, mechanical arts, and the goal of mastering nature by mastering the language of its signatures<sup>6</sup>. In accordance with Paolo Rossi remains Charles Whitney, who in the book entitled “Francis Bacon and Modernism” argues that Bacon’s natural philosophy marked the beginning of “a revolution in thinking that will lead to radical changes in culture”, for in many ways Bacon’s discovery of natural philosophy was “itself a kind of reform or fulfillment of rhetorical ideals and practices”<sup>7</sup>. Having mentioned the importance of language in Bacon’s natural philosophy, there arises a need to analyze the links between Bacon’s natural philosophy and his views on the issue of language.

Bacon’s *New Atlantis* is a good example integrating all his theoretical and practical views and desires, presenting a perfect state built on the laws of nature which, in turn, constitute the foundation of the Atlantic society. The laws the society is built on are natural and, therefore, successful. Although they are not revealed like natural knowledge, they can be examined when some effort is put and a certain doze of observation is employed. In *The Advancement of Learning* Bacon writes that “the just and lawful sovereignty over men’s understanding, by force of truth rightly interpreted, is that which approacheth nearest to similitude of divine rule”<sup>8</sup>. Truth, which is the product of logical method in act, regulates thought according to the fixed laws providing a proper vehicle for domination not only on the intellectual level but also in the world<sup>9</sup>. In this way, the concept of law remains in the centre of Bacon’s program of natural philosophy. Indeed, his permanent reference to the concept of law is not surprising bearing in

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<sup>5</sup> Compare P. Rossi, *Francis Bacon: from Magic to Science*, (trans.) Sacha Rabinovitch, University of Chicago Press, Chicago, 1968, p. 16; C. Whitney, *Francis Bacon and Modernism*, Yale University Press, New Haven, 1986, p. 12; and M. Wiszniewski, *Bacona metoda tłumaczenia natury*, Państwowe Wydawnictwo Naukowe, 1976, pp. 34–50.

<sup>6</sup> P. Rossi, *Francis Bacon: from Magic to Science*, op. cit., p. 16.

<sup>7</sup> C. Whitney, *Francis Bacon and Modernism*, op. cit., p. 12.

<sup>8</sup> F. Bacon, *The Advancement of Learning*, BI, VIII:3 – HTML edition, 1998 (based on G. W. Kitchin’s 1861 edition; paragraph sections according to J. Spedding’s 1854 edition; available to be reproduced freely in unaltered form provided that this editorial comment is included; copyright 1998 by Dr. Hartmut Krech, Bremen, Germany (kr538@zfn.uni-bremen.de), displayed at: <http://darkwing.uoregon.edu/%7Erbear/adv1.htm>; as retrieved on 21.III.2005.

<sup>9</sup> See R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 87.

mind the fact that he was a lawyer himself, which explains his need to regulate everything by the means of the written and legalized word, that is, a law.

Regarding Bacon's concept of law, it appears to have its origins in the basic assumptions about the fallacy of human nature. Adam fell from paradise, which brought the destruction of the principal order on earth, bringing the consequences visible in every field of life. The direct heritage of that dramatic fall was man's predisposition towards idleness and pleasure, the root of all evil. Therefore, man was doomed to fight with his inclination towards evil even in learning. In the first book of the *Advancement of Learning* Bacon concludes that it is necessary "to keep and defend the possession of the mind against idleness and pleasure, which otherwise at unawares may enter to the prejudice of both"<sup>10</sup>. In the *Advancement of Learning* Bacon also refers to "the lawfulness of the phrase or word"<sup>11</sup> in the context of superfluous decorum of the written text which consequently darkens a clear understanding of the writer's purpose, which is also a heritage after the fall of the first people.

While referring to the concept of law, Bacon also alludes to the role of the king as the one after God to rightly keep it. He gives the examples of Moses and David who are the true "pastors of their people"<sup>12</sup>. The conclusion he draws on that premise is simple: "That Kings ruled by their laws as God did by the laws of Nature"<sup>13</sup>. Therefore, the king is the head who governs the state according to the laws which are based on truth: "the fundamental laws of nature, with the branches and passages of them, [are] an original and first model, whence to take and describe a copy and imitation for government"<sup>14</sup>. In this way, "law is a vehicle for achieving sovereignty over men's understanding in politics, natural philosophy, and language, and it achieves theological sanction from God"<sup>15</sup>.

If law is central in the order of nature, it must be central in the order of natural philosophy as well as in the structure of language. In the passage taken from *Cogitationes de Natura Rerum* (*Thoughts on the Nature of Things*) written in 1624 Bacon returns to the issue of language in order to

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<sup>10</sup> F. Bacon, *The Advancement of Learning*, B1, II:7.

<sup>11</sup> Ibid., BI, IV:2.

<sup>12</sup> Ibid., BII, XXI:8.

<sup>13</sup> Ibid., BII, XXI:8.

<sup>14</sup> Ibid., BII, XXI:8.

<sup>15</sup> R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 87.

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find a model for his desired “course of application”<sup>16</sup>. He writes: “Surely as the words or terms of all languages, in an immense variety, are composed of a few simple letters, so all the actions and powers of things are formed by a few natures and original elements of simple motions”<sup>17</sup>. Therefore, natural philosophy “is conceived as a logically constructed alphabet of nature enabling the user to decipher its laws of motion”<sup>18</sup>. The search for unifying laws in nature consequently leads him to the idea of natural philosophy and universal language’s laws as being similar to those present in nature.

Bacon’s desire to find a universal key in nature acquires a metaphysical context when he refers to the law created by God and hidden in nature’s primary order. Not surprisingly, allusions to Adam and the Adamic language are frequent in Bacon’s writings. Naturally, Adam is presented as “possessing the pure knowledge of nature and universality, a knowledge by the light whereof man did give names unto other creatures in Paradise, according unto their properties”<sup>19</sup>. Having created Adam after his image, God let him govern the nature. The language was given to Adam as a precious gift so that he could communicate with Eve and manage the earth’s treasures. Unfortunately, the gift was lost as a result of Adam’s fall and from that moment on “the freeing of the minds depends upon men’s revision of the world”<sup>20</sup>. Moreover, such a revision is “a part of the reform of the knowledge”<sup>21</sup>. Hopefully, the discovery of Creator’s primary vision is possible:

God forbid that we should give out dream of our own imagination for a pattern of the world; rather may he graciously grant to us to write an apocalypse or true vision of the footsteps of the Creator imprinted on his creatures...<sup>22</sup>

Therefore, the parallels between the natural philosophy and the Adamic language are obvious: Bacon’s sees natural philosophy as “a kind of second scripture” promising the return to the primary Edenic perfection whereas natural philosophy, itself a perfect language, promises a quick return to

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<sup>16</sup> F. Bacon, *Thoughts on the Nature of Things*, in “The Philosophical Works of Francis Bacon”, op. cit., p. 467.

<sup>17</sup> *Ibid.*, 467.

<sup>18</sup> R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 90.

<sup>19</sup> F. Bacon, *The Advancement of Learning*, BI, I:3.

<sup>20</sup> P. Rossi, *Francis Bacon From Magic To Science*, op. cit., p. 163.

<sup>21</sup> *Ibid.*

<sup>22</sup> F. Bacon, *The Great Instauration*, displayed at: <http://www.whale-hunter.net/dongli/ShowArticle.asp?ArticleID=1206> as retrieved on 14.V.2005.

the Edenic (perfect) language<sup>23</sup>. In other words, Bacon held that Adam possessed metaphysical knowledge to a very high degree. Moreover, for him the whole nature was a book which he could read with ease. Paolo Rossi reminds on Bacon's behalf that "the pages of nature's great book should be read with patience and reverence, pausing and meditating over each one and discarding all easy interpretations"<sup>24</sup>. Bacon stubbornly believed that metaphysical knowledge could be retrieved and again and again he proclaimed his longings to possess the secret of the inner things which Deborah Taylor Bazeley rightly calls "a Baconian desire to appropriate the power of naming"<sup>25</sup>.

While searching for the universal key to the laws of nature, Bacon comes up with the idea of scientific communication. Since language is a mirror reflecting the real picture of the world, scientific communication must be characterized above all by brevity, precision, and plainness: these are the general standards by which he proposes to guide a philosophical discourse. The appeal to precision as regards to words once again appears in Bacon's *Preparative Toward Natural and Experimental History* written in 1620:

...never cite an author except in a matter of doubtful credit: never introduce a controversy unless in a matter of great moment. And for all that concerns ornaments of speech, similitudes, treasury of eloquence, and such like emptinesses, let it be utterly dismissed. And let all these things which are admitted be themselves set down briefly and concisely, so that they may be nothing less than words...<sup>26</sup>

Again, according to Bacon, a perfect model of scientific communication is hidden in man's understanding of nature and its laws which seem to be definitely underrated or even neglected:

It seems to me that men look down and study nature as from remote and lofty tower. Nature presents to their gaze a certain picture of herself, or a cloudy semblance of a picture, in which all the minute differences of things on which the practice and prosperity of men rest, are blurred by distance. So men toil and strive, straining the eye of the mind, fixing their gaze in prolonged meditation, or shifting it about to get things into better focus. Finally they construct

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<sup>23</sup> R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 99.

<sup>24</sup> P. Rossi, *Francis Bacon From Magic To Science*, op. cit., p. 32.

<sup>25</sup> D. Taylor Bazeley, *The Seventeenth-Century Context: The Discourse of the New Science As The Ultimate Masculine Register*, displayed at <http://www.she-philosopher.com/library/diss-appB.html> as retrieved on 17.VI.2005.

<sup>26</sup> F. Bacon, *Preparative Toward Natural and Experimental History*, aphorism III, displayed at: <http://www.constitution.org/bacon/preparative.htm> as retrieved on 25.VI.2005.

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the arts of disputations, like ingenious perspective glasses, in order to seize and master the subtle differences of nature. A ridiculous kind of ingenuity, is it not, and misdirected energy for a man to climb his tower, arrange his lenses, and screw up his eyes to get a closer view, when he might avoid all that laborious contrivance and tedious industry and achieve his end by a way not only easy but far superior in its benefits and utility, namely by getting down from his tower and coming close to things?<sup>27</sup>

In the article entitled “The Seventeenth-Century Context: The Discourse of The new Science As The Ultimate Masculine Register” Deborah Taylor Bazeley discusses the language theories of the new science movement in terms of gender, giving an interesting account of Francis Bacon’s vision of the language of the new science based on Bacon’s statement that “the true philosophy which echoes most faithfully the voice of the world itself”<sup>28</sup>.

Therefore, when Bacon approaches the creation of a philosophical language, he clearly attempts at what R. E. Stillman calls “closing the gap between a natural philosophy conceived on the model of a perfected language”<sup>29</sup>. The model to refer to is exclusively nature; the data to analyze is well hidden in its laws. Everything man has to do is to get down from his tower and come close to things.

While searching for a perfect language, Bacon tackles the very nature of language. Bearing in mind Bacon’s admiration for the Chinese system of writing, it is clear that for Bacon, language is an “instrument of transmission”, capable of benefiting from other means besides words and letters:

We are handling here the currency (so to speak) of things intellectual, and it is not amiss to know that as moneys may be made of other material besides gold and silver, so other Notes of Things may be coined besides words and letters...<sup>30</sup>

Bacon’s *De Augmentis Scientiarum* contains perhaps the most complete discussions of the communication sciences, or what he calls the Art of Trans-

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<sup>27</sup> F. Bacon, *Redargutio Philosophiarum*, in “The Philosophy of Francis Bacon”, (ed.) B. Farrington, Liverpool University Press, Liverpool, 1964, p. 129.

<sup>28</sup> Claiming that Bacon was the first Englishman to wrestle with the language issues relating to the new science, she suggests that Bacon’s discourse was similar to his society’s “feminine speech ideal” where nature is referred to in the masculine gender, as Pan, whereas language is feminine, being referred to as either the good wife Echo or the bad daughter Iambe. See D. Taylor Bazeley, *The Seventeenth-Century Context: The Discourse of the New Science As The Ultimate Masculine Register*, displayed at: <http://www.she-philosopher.com/library/diss-appB.html> as retrieved on 17.VI.2005.

<sup>29</sup> R. E. Sillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 86.

<sup>30</sup> F. Bacon, in “The Philosophical Works of Francis Bacon”, op. cit., p. 343.

mission<sup>31</sup>. In a letter of advice to Fulke Greville he outlines two principal methods of note taking: “He that shall out of his own reading gather notes for use of another, must (as I think) do it by Epitome, or Abridgment, or under Heads or Common Places. Epitomes may also be of two sorts: of any one Art or part of Knowledge out of many Books, or of one Book by itself”<sup>32</sup>.

Accordingly, the first method, that is, by epitome or abridgment, is to summarize or paraphrase the original texts; these notes, generally presented in the order of the text from which they were produced, are often called *adversaria*. The second method is to select passages of interest for their content or style, which are copied and sorted under a thematic heading to facilitate retrieval<sup>33</sup>. These categories and the notes that correspond to them are usually called commonplaces. Bacon favoured the latter as of “far more profit and use”<sup>34</sup>. According to R. E. Stillman, Bacon’s arts of transmission represents “his most sophisticated efforts to wrestle with the language”, at the same time being “the culmination and the end limit to Bacon’s philosophical thought about language”<sup>35</sup>. The project of the language cleansed of the idol of the market place and presented in the *Novum Organum* echoed the perfected language based on the new philosophy and elaborated according to the Art of Transmission. The new language meant to free knowledge from the organum.

Bacon’s concerns with the issue of language also find their way in *The Advancement of Learning*, where he presents the science of grammar which, being a product of man’s considerations about speech and words, in many cases is to blame for the “confusion of tongues”:

Concerning speech and words, the consideration of them hath produced the science of grammar: for man still striveth to reintegrate himself in those benedictions, from which by his fault he hath been deprived; and he hath striven against the first general curse by the invention of all other arts, so hath he sought to come forth of the second general curse which was the confusion of tongues, by the art of grammar...<sup>36</sup>

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<sup>31</sup> The art of transmission in its broad sense refers to the different forms of writing and printing through which texts were preserved through times.

<sup>32</sup> F. Bacon, quoted in V. F. Snow, *Francis Bacon’s Advice to Fulke Greville on Research Technique*, in “Huntington Library Quaterly” 23, 1960, p. 370.

<sup>33</sup> *Ibid.*, p. 370.

<sup>34</sup> *Ibid.*

<sup>35</sup> R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 107.

<sup>36</sup> F. Bacon, *The Advancement of Learning*, BII, XVI:4.

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While further elaborating on the use of grammar, Bacon mentions its two natures, that is, practical and philosophical, out of which it is definitely philosophical that is more perfect than the natural one:

The duty of it is of two natures; the one popular, which is for the speedy and perfect attaining languages as well for intercourse of speech as for understanding of authors; the other philosophical, examining the power and nature of words, as they are the footsteps and prints of reason [...] and therefore I cannot report it deficient, though I think it very worthy to be reduced into a science by itself...<sup>37</sup>

The importance of the nature of words is revealed in the definition which Bacon's attached to them; words are seen as "the footsteps and prints of reason"<sup>38</sup>. The words, therefore, were to be deprived of their ambiguity and vagueness, which were the main features of the idol of the market place. To do that, Bacon set out to analyze the nature of the ciphers, the smaller units of the words, which "are commonly in letters or alphabets but may be in words"<sup>39</sup> and whose three virtues Bacon highly praises: "they be not laborious to write and read; that they be impossible to decipher, and, in some cases, that they be without suspicion"<sup>40</sup>. The allusions to the language of nature deciphered by God is visible here: "this art of ciphering hath for relative an art of deciphering, by supposition unprofitable, but, as things are, of great use; but suppose that ciphers were well managed, there be multitudes of them which exclude the decipher"<sup>41</sup>.

In *The Advancement of Learning* Bacon gives a high value to the importance of letters, the smallest units of the words, concluding: "Nay, there is a ground of discourse [...] which is a discourse upon letters, such as are wise and weighty [...]. For letters have a great and more particular representation of business and either chronicles of life"<sup>42</sup>. However, words, being "chronicles of life" are subjected to absorbing ambiguity and vagueness remaining part of human thinking. A universal language may therefore be constructed on the basis of words as well as on "signs":

This then may be laid as rule; that whatever can be divided into differences sufficiently numerous to explain the variety of notions (provided those differen-

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<sup>37</sup> Ibid., BII, XVI:4.

<sup>38</sup> Ibid., BII, XVI:4.

<sup>39</sup> Ibid., BII, XVI:6.

<sup>40</sup> Ibid., BII, XVI:6.

<sup>41</sup> Ibid., BII, XVI:6.

<sup>42</sup> F. Bacon, *The Advancement of Learning*, BII, XXIII:9.

ces be perceptible to the sense) may be made a vehicle to convey the thoughts of one man to another...<sup>43</sup>

Consequently, he recognizes two types of notions: *ex congruo* (iconic or motivated) and *ad placitum* (arbitrary or conventional). *Ad placitum* can be regarded as “a real notion” if it refers not to the defined word but directly to the thing<sup>44</sup>. In other words, signs may act as symbols; to do that, they must be perceptible to the human senses and represent different elements to refer to a particular idea or thing. Gestures, hieroglyphics, and ideograms are the direct symbols of notions and things.

Bacon’s conviction as to the power hidden in letters is visible in his numerous analogies between natural philosophy and the alphabet. As R. E. Stillman observes, Adam’s naming of the creatures is a significant trope for Bacon since Adam penetrated in the very nature of things and was therefore able to grasp the link between the signifier and the signified<sup>45</sup>. Bacon’s frequent references to nature as a book inscribed with divine signatures is apparent in the *New Atlantis*, where the state is organized according to the laws of nature and nature is read and interpreted as a divine scripture.

The conventional approach to the issue of language, which was a result of human inclination towards ambiguity and abstraction, finds its way in Bacon’s statement that “the false appearance imposed upon us on words, which are framed and applied according to the conceit and capacities of the vulgar sort”<sup>46</sup>. The key is a search for the primary means hidden in the scripture of nature, where everything has its definite meaning: “So as it is almost necessary in all controversies and disputations to imitate the wisdom of the mathematicians, in setting down in the very beginning the definitions of our words and terms that others may know how we accept and understand them, and whether they occur with us or no”<sup>47</sup>.

Finally, the parallels between the natural philosophy and language reveal Bacon’s appeal to translate the laws of nature: “Human beings are the executives and interpreters of nature”<sup>48</sup>. If God is a code-maker, nature is decipherable and man is challenged to become a code-breaker. As

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<sup>43</sup> Ibid., BII, XXIII:9.

<sup>44</sup> See F. Bacon, *The Advancement of Learning*, BII, XVI:3.

<sup>45</sup> R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 98.

<sup>46</sup> F. Bacon, *The Advancement of Learning*, BII, XIV:11.

<sup>47</sup> Ibid., BII, XIV:11.

<sup>48</sup> F. Bacon, *Novum Organum*, B1:I.

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R. E. Stillman notes, the perception of knowledge as understood by Bacon involves always one and the same operation: the translation of the voice of the world's order from one language, that is, the order of signatures, into another language, the order of natural philosophy; thus, natural philosophy becomes an objective transcription, "a neutral and passive dictation from the language of things"<sup>49</sup>.

Therefore, Bacon's natural philosophy becomes a universal language whereas a universal language becomes an integral part of such philosophy. The establishment of each promises the return to the Edenic perfection and universality, that is, the key to the perfect state for, as Bacon notes, "it is impossible to capture nature in other way than by listening to it"<sup>50</sup>. The message is clear – the language of nature must be learnt anew for, as Paolo Rossi has rightly grasped Bacon's message, "it had suffered the confusion of the Tower of Babel and man must come to it again, not searching for marvels and surprises but handling, like a little child, each letter of its alphabet"<sup>51</sup>.

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<sup>49</sup> R. E. Stillman, *The New Philosophy and Universal Languages in Seventeenth-Century England Bacon, Hobbes, and Wilkins*, op. cit., p. 98.

<sup>50</sup> F. Bacon, *Novum Organum*, B1:III.

<sup>51</sup> P. Rossi, *Francis Bacon From Magic To Science*, op. cit., p. 32.