RUCH FILOZOFICZNY
LXXV 2019 4

Zbigniew Pietrzak
University of Wrocław, Wrocław, Poland
ORCID: 0000-0003-2458-1252
e-mail: zbigpietrzak@wp.pl

John Locke's Historical Method and "Natural Histories" in Modern Natural Sciences

DOI: http://dx.doi.org/10.12775/RF.2019.058

Introduction

Among the many fundamental issues that helped shape the philosophy of the seventeenth and eighteenth centuries, one concerned the condition of philosophy and scientific knowledge, and in the area of our interest – knowledge about nature.[1] These philosophical inquiries included both subject-related problems concerning human cognitive abilities and object-related ones indicating possible epistemological boundaries that nature itself could have generated. Thus, already at the turn of the sixteenth and seventeenth centuries, from Francis Bacon, Galileo, and

[1] These reflections are an elaboration on the topic I mentioned in the article "Historia naturalna a wiedza o naturze" [Natural History vs. Knowledge of Nature], in: *Rozum, człowiek, historia*, [Mind, Man, History], ed. Jakub Szczepański (Cracow: Wydawnictwo Uniwersytetu Jagiellońskiego, 2018); as well as in my master's thesis: *The Crisis of Cognition, the Crisis of Philosophy* (not published). It is also a debate over the content of Adam Grzeliński's article entitled "Rozważania dotyczące rozumu ludzkiego' Johna Locke'a: teoria poznania i historia" [John Locke's 'An essay on human understanding': epistemology and history"], in: *Rozum, człowiek, historia*, ed. Jakub Szczepański (Cracow: Wydawnictwo Uniwersytetu Jagiellońskiego, 2018), as well as some of the themes of the author's monograph *Doświadczenie i rozum. Empiryzm Johna Locke'a* [Experience and reason. The empiricism of John Locke] (Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, 2019).

Descartes to John Locke and Robert Boyle, scholars and philosophers initiated a critical analysis of contemporary knowledge and an attempt to diagnose the causes of its condition.[2] The conclusion was quite clear – neither scientific knowledge nor philosophy met the expectations regarding the practical benefits that knowledge should bring and theoretical ideas incorporating universal laws. These would describe and explain the functioning of nature, which in turn would make it possible to forecast the phenomena taking place in it and thus enable the controlling of nature. The lack of these elements in science led to the claim that science and philosophy were in decline.

A critical analysis of the knowledge of that time would not have been fruitful and heuristically valuable, if it had not been aimed at developing an effective "weapon" to overcome this crisis. Regardless of their methodological and epistemological positions, scholars came to a common conclusion – they advocated the need to construct a new method for acquiring and organizing knowledge, and consequently to develop a way to reach the truth.

Acceptance of the method as a factor allowing for the modernization of science and philosophy did not mean that scientists proposed only one type thereof. The variety of views on the sources of cognition and the ways to construct knowledge led to the emergence of different types of preferred methods. Without delving into details,[3] for the purpose of this paper it should be noted that this diversity can be reduced to two basic types: a mathematical method based on deduction and an experimental (empirical) method supported by induction.[4] Thus, the efforts to get science and philosophy out of the crisis resulted in different methodologies. Within the framework of different concepts, methods were proposed which, in the opinion of their authors, would change the quality of existing knowledge and enable its "renewal".

---

[2] The links between philosophy and scientific knowledge, especially the knowledge of nature, were obvious until the eighteenth century. It was only a century earlier that the process of separating sciences from philosophy and their autonomization was initiated. Paradoxically, it was an effect of a philosophical – methodological, epistemological, ontological, and so on – reflection conducted at that time with regard to the state and status of scientific knowledge.

[3] This problem is the subject of an analysis of almost every work devoted to philosophy and history of science, especially from the turn of the sixteenth and seventeenth centuries.

[4] The importance of induction procedures for experimental sciences is evidenced by the fact that Francis Bacon attempted to create new induction. The traditional Aristotelian induction was already outdated and did not live up to the hopes placed in it. Moreover, as Francis Bacon claimed, it was a source of errors rather than successes; cf. Francis Bacon, *The New Organon*, ed. Lisa Jardine and Michael Silverthorne (Oxford: Oxford University Press, 2000), 17, 34 ff; 83 ff.

The idea that the new method allows for the "renewal" of scientific knowledge (and philosophy) is based on the assumption that it is possible to develop such a uniform tool as allows one to acquire, organize and, above all, legitimize knowledge from such distinct fields as mathematics, physics, medicine, "natural histories", and philosophy. Thus, such a method should be universal enough to expand the boundaries of cognition within these different fields. Expand, i.e. be a source of knowledge (information) unavailable if obtained only with the use of methods applied up to that time.[5] The belief in the primacy of the method in developing knowledge on the role of cultural, religious factors, and even the object of cognition itself,[6] made the proposed solutions philosophical, logical, or even psychological (as in John Locke's case), but not metaphysical or theological. Thanks to this, the proposals had a reasonable (rational) basis and could concern issues from the field of reason, not religion, art, or alchemy, astrology and even magic, which still functioned in the seventeenth century. Therefore, they corresponded to the model of knowledge that was to become scientific knowledge.

The main problem I would like to raise in this article is whether the proposal of John Locke's "historical method", which in the opinion of the philosopher is an alternative to the mathematical and experimental methods, could have a practical meaning in the process of studying nature and building knowledge of this area, building "natural histories". Was this method universal enough to be useful in research in the field of nature or at least to enable the construction of natural sciences? And would it really be an alternative to this mathematical and experimental "dualism"?

Disputes over the Method

In the mathematical method John Locke saw both positive elements, i.e., those useful for the improvement of science, and serious limitations. This meant that he could not accept it with such enthusiasm and to such an extent as mathematicians-naturalists, Galileo, Kepler, Descartes, and Newton did. The criticism expressed by this philosopher included, first of all, doubts as to the usefulness of the method in the study of nature. They resulted from the fact that mathematicians and mathematics (followed by mathematized natural history) constructed their objects, which were therefore abstractions. In their definitions, a mathematician

[5] Cf. René Descartes, *Discourse on the method*, transl. Elisabeth S. Haldane and G. R. T. Ross (Mineola–New York: 2003), esp. Part Two, 9–16.

[6] The universality of the method was to be based on the fact that it would include all the objects available for our cognition.

includes all the important properties and combines them into logically necessary relationships, therefore, as Locke writes, "we cannot conceive them separable from them by any power whatsoever. […] Thus the idea of a right-lined triangle necessarily carries with it an equality of its angles to two right ones".[7] A similar situation, according to Locke, occurs in the field of morality. The concepts functioning in it, such as justice or property, are defined "entities".[8] They can be used, they can organize social relations, provided that they are somehow (more or less precisely) defined, even if it is only the result of a long ("unspoken") tradition. Unlike mathematical entities, however, the functioning of moral (ethical) concepts in the mental sphere requires that they are accepted by at least part of the group. Mathematical entities in this sense do not depend on the general consensus – their truthfulness and objectivity does not result from the relative understanding of deductive conclusions.[9] And such relativity always accompanies the concepts that regulate social relationships.

This does not change the fact that moral (and ethical) categories are constructed on the basis of mathematical entities since, as we read from Locke, "Mathematicians abstracting their thoughts from names, and accustoming themselves to set before their minds the ideas themselves that they would consider, and not sounds instead of them, have avoided thereby a great part of that perplexity, puddering and confusion."[10] And it should be added – just like philosophers dealing with morality, ethics, and law. Therefore, the work of Benedict Spinoza could be constructed "geometrically"[11].

The consequence of this manner of constructing mathematical (and moral) entities is their deductibility. Both within a given mathematical object and within a moral concept, we can deduce some of its properties from the others (the "triangularity" implies "three angles" or the fact that the sum of angles in a triangle is 180º). By performing actions of "displacement", "rotation", or "division" in accordance with the

[7] John Locke, *An Essay concerning Human Understanding*, bk. IV, chap. III, par. 29, ed. Peter H. Nidditch (Oxford: Oxford University Press, 1975), 559.

[8] One can refer here to the work of Benedict Spinoza, Ethics: Proved in geometrical order. Spinoza, like Euclid, first introduces definitions, then axioms, theorems, and evidence thereof (referring to definitions and axioms). The content logically follows from the structure. Cf. Benedict de Spinoza, *Ethics*, transl. R. H. M. Elwes (https://www.gutenberg.org/files/3800/3800-h/3800-h.htm; access: 24.12.2019).

[9] This fact is also emphasized by Descartes, cf. *Discourse*, 13.

[10] Locke, *An Essay*, bk. IV, chap. III, par. 30, 561.

[11] This awareness of Locke's of the links between concepts or mathematical and moral ideas is highlighted by Przemysław Wewiór in "Wstęp tłumacza do 'Zasad filozofii przyrody' John'a Locke'a" [Translator's introduction to John Locke's "Elements of Natural Philosophy"], *Studia Philosophica Wratislaviensia* IV, 3 (2011): 129.

accepted rules, we can also achieve in geometry the expected effects. In short, thanks to these rules, on the basis of some properties, we can obtain information about other attributes. But does it expand our knowledge? Can we use this method to research nature? That is, is such a deductibility of properties in nature possible and legally valid? Not for Locke (and probably neither for Bacon nor Boyle). In relation to natural objects, especially in animated nature, we cannot deduce other characteristics in an empirically, materially (but also logically) necessary way on the basis of some properties: "Because it is no consequence – says Locke – one way or the other from my complex idea; the necessity or inconsistence of malleability hath no visible connexion with the combination of that colour, weight, and fusibility in any body".[12] This kind of statement demonstrates that this deductive manner of learning about the world (and also constructing knowledge) has its limitations. One could be tempted to say that such a concept of the method cannot lead to the construction of a universal science, which would include both mathematical (as well as moral, ethical, legal) and natural entities, let alone philosophical, historical, social ones, and so on. This still leaves open the question about the existence of such a universal method as a commonly used tool of cognition and about the existence of a universal science (universal model of science) covering all areas of human knowledge. Covering, i.e. offering uniform principles for all sciences and simultaneously allowing the construction of such principles. The establishment of such a general science would also provide a basis for constructing a new philosophy, which could obtain the status of scientific knowledge or even be identified with a new (universal) science.[13]

---

[12] Locke, *An Essay*, bk. IV, chap. III, par. 9, 645. From today's perspective, we know that nature does not work in a completely arbitrary way, although there is no such logical relationship here as in the case of mathematical entities. The emergence of some traits from others depends on the laws of physics, chemistry, biology, and even ecology. Robert Boyle also writes about the acquisition of traits and the possibility to deduce them – this is, in a sense, what *The Sceptical Chymist*, especially part VI, is devoted to.

[13] Descartes wrote that "all the principles of these sciences (mathematical and other – Z. P.) should be derived from a philosophy in which I have not yet found a sufficiently solid foundation"; cf. Descartes, *Discourse*, 16.

Another problem is Locke's attitude to the experimental method and empiricism. Of course, it is generally positive, but Locke's views on the subject have also evolved. Adam Grzeliński points this out in his work "Dwa wczesne eseje medyczne Locke'a" [Two early medical essays by Locke]. He refers to the development of Locke's views on research methods by analyzing his methodological position in early works on medicine – *Morbus* and *Anatomy.* This analysis provides an interesting picture of Locke's methodological transformations as an empiricist. In addition to empiricism, the philosopher sees a place for speculation in medical research, thus referring to the philosophy of galenists and paracelsians. Only later does the idea that

The Historical Method – Its Scope

Taking into account the criticism of the methods proposed by the supporters of the mathematization of the natural sciences and empiricists preferring experimental methods, Locke presented – as already mentioned – his own method of research. He writes: "I shall imagine I have not wholly misemployed myself in the thoughts I shall have on this occasion, if, in this historical, plain method, I can give any account of the ways, whereby our understandings come to attain those notions of things we have".[14] In the scope we are interested in, we should add: about material "things", that is, about nature.

It should be emphasized that Locke wants to use the proposed "historical method" for research on the mechanisms of acquiring and constructing various concepts (ideas) by human reason (mind). So Locke (as an empiricist) does not study nature, but human cognitive mechanisms. He is not looking for a method to study nature, but for a method to study human reason. In the above context we can ask a question about the legitimacy of the problem formulated in this paper. The question about the usefulness of the "historical method" in cognition of nature is methodological and epistemological and does not refer only to Locke's research practice and the subject of his research.

The question about the usefulness of the "historical method" in nature research is prompted by the fact that until the eighteenth century natural science was constructed in a historical way – it was precisely the said "natural histories", "histories of experiments", etc. The titles of many works of modern and more recent naturalists confirm the conviction that their works are a special case of some universal model of natural sciences based on historical knowledge organizing the knowledge about nature and natural phenomena themselves "in a historical way".[15] In this context, one cannot ignore Locke's interest in nature,

research should be based on experience gain an advantage and this concept becomes a fundamental theme in opinions on methodology in the history of medicine and, consequently, natural histories. Cf. Adam Grzeliński, "Dwa wczesne eseje medyczne", *Studies in the History of Philosophy* 1/7 (2016): 107–109.

[14] Locke, *An Essay*, bk. I, chap. I, par. 2, 44. This issue is the covered by the first two books of the Essay.

[15] Some examples: Gonzalo Hernandez de Oviedo y Valdesa (1478–1557), *Historia general y natural de las Indias* [Natural and Common History of India] (1526); Konrad Gesner, *Historia animalium 1551–1558*; Robert Boyle: *Natural History of Human Blood* (1684), *Experimental History of Mineral Waters* (1684–1685), *General History of the Air* (1692); quoted from: *Contents of Works of Robert Boyle*, Michael Hunter and Edward B. Davis (eds.), vol. 1–14, London and New York 1999–2000.

which Adam Grzeliński points out.[16] Locke's interests in nature and his research are reflected in his work *Elements of Natural Philosophy*.[17] Conducting research in this field, Locke participated in the creation of this trend of natural science, referred to as "natural histories".[18]

Thus, the fundamental question for these considerations is: can Locke's "historical method" be useful for nature research? The question should perhaps be extended: can it also be a method for constructing natural sciences?[19]

Let us therefore briefly describe the "historical method".[20] Looking for the genesis (sources) of concepts which are used by people and which constitute knowledge (including scientific knowledge), Locke conducts observations of mechanisms enabling the acquisition and accumulation of concepts and knowledge. He also points to their variable

---

[16] Grzeliński, "'Rozważania dotyczące rozumu ludzkiego' – teoria poznania i historia"; idem, *Doświadczenie i rozum*. At this point it is worth quoting two remarks of the author from the former work: "His [i.e. Locke's – Z. P.] earlier notes and works, dating back to the 1960s, reveal his interest primarily in political issues, medicine, and natural history, and to a lesser extent in theoretical philosophy", 18 ff. The author goes on to write that "ultimately, Locke's 'simple historical method', which underlies the resolutions presented in his Essay concerning Human Understanding, is the result of the use of methods used in the studying of nature, and according to Locke, the same resolutions were supposed to justify the achievements of modern science," 20, as well as 96 ff., 100 ff.

[17] More on the subject by Przemysław Wewiór in the aforementioned "Wstęp tłumacza", passim.

[18] However, would this indicate a retreat from speculation to empiricism? In Locke's philosophy and his epistemological and methodological views, i.e. views on the possibility of human cognition, including nature, it is connected with his theory of ideas. On this subject, cf. Przemysław Wewiór, "Wstęp tłumacza", passim.

[19] Justifying this distinction, I will once again recall Spinoza's *Ethics*. As mentioned earlier, its structure and resulting content was constructed on the basis of Euclid's Elements. However, it is not a mathematical work, nor is it a geometry textbook, but, as the title indicates, the author attempts to constitute ethics as a deductive system. Its structure is constructed/established in a "geometrical way". One can therefore expect that a method that allows the construction of a system can be "borrowed" from another field (in the case of Spinoza's work, it is a geometrical method). Spinoza's idea is based on the Cartesian concept of "universal mathematics", which realizes this model of constructing knowledge on a global scale, while Spinoza uses it in a specific case.

[20] In this work, I do not attempt to reconstruct Locke's "historical method". This would go beyond the scope of the article, as it would require an extensive analysis of Locke's works. This philosopher does not create any theoretical basis for his method, but implements it in practice. The reader can see how this method "works". The style of Locke's narration, the way of posing and developing this problem resembles the style of Robert Boyle. Locke, like Boyle, avoids the theory (but not the theoretical reflection) aimed at analyzing the "historical method". Its effectiveness and legitimacy is demonstrated in research practice – it is in this practice that the advantages (and disadvantages) of the proposed methodologies are revealed.

role in its functioning. He refers to experience, thus introducing an empirical component.[21] Locke uses source materials – descriptions of past events, tradition, reports from many sources. This is an non-mathematical method both because of its structure (it does not consist of a system of definitions, statements, etc.) and because of its content (it does not deal with constructing abstract notions, although it examines their genesis). This method also includes a kind of argumentation based on building analogies between the individual and the social, and in the context of Locke's deliberations – between the individual acquisition of knowledge and the genesis of social (culturally conditioned) cognition and the building of knowledge, including natural science. In the latter case, one can even attempt to say that Locke's deliberations should also be considered in the biological dimension, i.e. beyond and outside culture, which could mean that the search for the sources of human cognition has a phylogenetic dimension.[22]

Regardless of the scale – individual, social or generic – to which Locke's deliberations relate, the immanent feature of his method is that it allows him to capture his object in a historical perspective. Or in other words, that the "historical method" by revealing the history of a phenomenon makes it possible to capture its development. But it can also be said that – perhaps – this method is what creates this historicity. What becomes interesting is the relation between what was in the past and what is contemporary, presented now. Referring to the genesis and historical processes, it is supposed to explain the observed phenomena. Thus, it reaches back to the past. On the other hand, by using incomplete data from the past (both individual and social), it fills these gaps with what is given at present (although does not have to be directly observable). Understanding what is historical and what is contemporary is possible thanks to reconstruction and analogy. *An Essay Concerning Human Understanding* is a reflection on "the history of human reason".[23]

In order to grasp nature in this way, it is necessary to assume that it has its own history. Not the past – because it does not raise any doubts of any empiricist who understands the surrounding world as an objective reality – but the very history.[24]

---

[21] Locke does not carry out experiments in this field, he restricts himself to analysis and observation. This is important because nowadays experiments are a fundamental source of information about perception, acquisition of concepts, construction of knowledge, etc. This is the field of contemporary cognitive science.

[22] Such a wording, however, is too closely linked to the evolutionary understanding of biological and social phenomena.

[23] Grzeliński, *Doświadczenie i rozum*, 96 ff.

[24] For Francis Bacon, having one's own history means knowing one's own background, one's own past, which cannot be limited to "fairy tales and rumours", but must be based on credible stories based on experience. Although the following

So what kind of knowledge – in terms of the object of cognition – can make use of the effects of Locke's method?

"The Historical Method" vs. "Natural Histories" (i.e. Learning about Nature and the "Histories" of Learning about Nature)

Let us start with the second question: can the "historical method" be used to develop natural sciences? What are these "natural histories"? How did the naturalists and philosophers of Locke's time understand them?

The titles of works mentioned above demonstrate that at least in the field of natural science, the way of constructing and narrating it according to the historical model was widely recognized. One could say, to paraphrase the title of Spinoza's work, that it was done "using the historical method".

This was for the following reasons.

At least in the field of natural sciences ("natural histories"), the new method, which was to enable the emergence of the new science, did not entirely negate the existing achievements. In a sense, therefore, their cumulative character, and thus the historical nature of knowledge, was not questioned. It is possible to indicate the chronology of discoveries of laws, natural phenomena and objects, but also the achievements of scientists – hence the "histories of experiments"; experiments which changed (expanded) knowledge.[25] "Histories" understood in this way gather data, information, and facts; therefore, this process – in the epistemological sphere – must have its own chronology, even if it is not fully recognized. However, this cumulative character (and its acceptance), in consequence, results in the content of natural knowledge being composed also of myths, religious beliefs, etc. Such natural sciences ("natural histories"), by absorbing myths, treat them on an equal footing with

---

remark concerns the history of the Greeks (or rather the absence of it), the same applies to the history of nature. Not "fairy tales", but observations and experiments and their catalogues determine the quality of knowledge about nature and its history. Cf. Bacon, *The New Organon*, 59 and 20 et seq.

[25] The seventeenth century could be called the age of experiments. Their growing number and importance for the development of knowledge about the world made it necessary to organize, classify, or verify the activities of scientists in this field and the results of their work. "The histories of experiments" had cumulative character; such a need of collecting observational data was postulated by Francis Bacon and Robert Boyle. Thus it can be called a canon of British modern empiricism; cf. M. A. Stewart's introduction in: M. A. Stewart, *Selected Philosophical Papers of Robert Boyle* (Manchester: University Press, 1979), xiii.

knowledge based on observations and empirical data.[26] Therefore, the border between what is scientific (rational or empirical) in the understanding of Locke (as well as Bacon and Boyle) and what is sacred, metaphysical, and mystical is blurred. Thus, according to the Renaissance and modern naturalists, the rationality of natural knowledge can also be founded on beliefs and not only on observations. As a result of this belief, nature can function according to the laws of nature (physics, chemistry), but also according to some "logic" of what is supernatural (for example, by the will of God). Besides, the physics and chemistry of that time were themselves based on principles which today are considered to be incompatible with the natural order. In the seventeenth century nature was still described and studied by the methods of alchemy, so it had properties considered constitutive for alchemists. The world of alchemists is subjected to non-material forces; it is possible that there may exist substances with properties exceeding what is physical (for example,

[26] This brief summary of the approach to understanding "natural histories" is not exhaustive. Francis Bacon devotes much attention to the characteristics of "natural histories", pointing out the difference between their traditional types and the new model he intends to build. Nowadays it is also a subject of philosophical and historical analysis. Peter J. Bowler, for example, points to the role of "traditions of humanities" and their relationship to emerging natural sciences in the constitution of "natural histories" as natural disciplines. In this way, it was possible to develop knowledge in which the ideas and methodologies of both these separate disciplines intertwined. This probably determined the relationship between natural scientists and philosophy and building relations between "natural history" and philosophy. The humanistic attitude towards nature was not an obstacle to its research and description, when the need to conduct one's own direct observations and potential experiments was not questioned. It became possible only when the absolute acceptance of the authority of Aristotle and other ancient thinkers was abandoned. This was the case in the sixteenth century and later. Cf. Peter J. Bowler, *The Fontana History of the Environmental Sciences* (London: Fontana Press, 1992), chapter "The Riches of Nature".

It should be emphasized that these "natural histories" can be treated as a literary genre, as a story about nature. Therefore, they do not have to be associated with the "historical method" used to acquire knowledge about nature. This is why we can say that the "historical" content of the above mentioned works is literal – they are histories of research and its results. A historical perspective is necessary to ensure that the content of the works is not detached from tradition, that it has its "historical context", even if, as in the case of Galileo, it is a denial of what has been achieved so far. But it is a discussion with content that has been accepted for centuries, with the tradition of research and conceptual practice. Natural histories are data collected in the past, but it is also a collection of traditions, methods, contents, conclusions.

Nowadays, the "historical" nature of natural sciences functions in a different "context". The "historicity" enables, or even "forces" one to compare, compile the results of observations, measurements, etc. Today, the value of conclusions formulated by climatologists is determined by this historical background. The lack of data from centuries ago would make it impossible to formulate such theses as global warming and human influence on this phenomenon.

the famous *alkahest*); it is the world of renewable minerals, the world of transmutation – the transformation of one substance into another and magic (witches, demons, dragons, beasts, etc.).[27] All these beings and phenomena are just as real for some of the naturalists of that time as the heliocentric structure of the cosmos was for Galileo.

Of course, observations as a method of providing science with relatively reliable empirical data (although often imperfect and error-prone) were postulated by all empiricists, as well as by alchemists, astrologers, and even supporters of the mathematical natural sciences. However, their cognitive and methodological status as the only source of cognition of nature becomes a binding element of research practice not earlier than in the seventeenth century. So far, as already mentioned, the observations had been accompanied by speculation not supported by any evidence. Even if some of these speculations referred to empiricism, the belief in the authenticity of such facts was based on a belief in the supernatural capabilities of nature.[28]

Therefore, not only are common ideas about nature founded on mythical and religious beliefs, but also the science of nature contains elements of tradition, beliefs, religious content, etc. Thus, natural science becomes an arena of beliefs, observations, and critical reflection emerging in the seventeenth century. Therefore, it has a cumulative nature, its genesis, history, various sources. The accumulated knowledge creates its own chronology. The "natural histories" are built in a "historical" way, which is why the "historical method" can be a method useful for constructing "natural histories", just as the "geometric method" is useful for developing ethics. Moreover, this empirical component, when it becomes an essential, inalienable means of cognition, can also become

[27] This is also what Robert Boyle writes about. Although in his work *The Sceptical Chymist* he quotes only the opinions of others on this issue, he does not explicitly exclude the possibility of such a phenomenon; cf. Robert Boyle, *The Sceptical Chymist* (London 1661), part VI (in fact, the whole work being a discussion with the concepts of alchemists, concerns the properties and "capabilities" of nature). In the modern works concerning nature one can point out countless examples of mixing the mythical with observational data. Particularly interesting are cases from zoological literature, e.g., the work of Konrad Gesner entitled *Historia animalium*.

[28] A classic example of this was the belief in the existence of "paradise birds"; "paradise" because they were deprived of legs. This belief was based on empirical data. In fact, Europe received already prepared "skins" of those birds that had no legs (or to be more precise – were devoid of the hock section). This was enough to recognize that such animals could live. What is more, in order to legitimize this belief, even the „ecology" of these birds was created – the way they breed, take food, etc. Cf. Georg Mauersberger, *Ptaki* [Birds], various translators (Warszawa: Muza SA, 1999), 364.

a selection factor for eliminating from "natural history" the content and even the whole disciplines that openly contradict empiricism.[29]

*

Let us move on to the first question: can the "historical method" be useful for learning about nature? Does it expand knowledge about nature, i.e. does it offer such possibilities as to enable us to formulate reliable knowledge about nature that goes beyond what is currently given in a direct way? In other words, does this method have any heuristic values in this context? Can the "history of human reason", its variability and the variability of human cognition be treated as a pattern/model of phenomena occurring in nature?

As already mentioned, the historical nature of cognitive processes does not raise any doubts in Locke, either in the individual (ontogenetic) or the social (phylogenetic) dimensions. Through cognitive processes, we acquire our knowledge as individuals (even taking into account gender) and as communities – nations, cultures. The "historical method" as a tool for analyzing and reconstructing the cognitive mechanisms of a human being allows us to capture its essential elements. However, is this method useful if this cognition is to adequately describe nature? And another question that should be asked in this context is: does nature have its own history?

Nature in its modern understanding is not subject to changes (development, evolution, irreversible degradation). No unique processes take place in it, unique in the sense that they are "located" in a specific time (period), i.e. historical ones. The world was created in its final form, despite the fact that this act lasted seven days. In the process of biblical creation, nature had to obtain full ownership in order to function. The world had to be formed, "finished" in order to fulfil its purpose (function), just as an architectural structure had to be completed. An unfinished building is not a building – the construction phase is not included in the "history" of its use. In the cosmic dimension, these different stages (the stage of creation, "forming", and the stage of functioning according

[29] The "historical method", however, is not "anti-cumulative", but it can "protect" knowledge from mythization. In practice, this means that at least potentially there is a possibility to exclude from natural science those elements that are contrary to experience and the general concept of nature, a concept referring only to one's own observations. As a result, however, paradoxes have arisen. When prepared specimens of platypus arrived in Europe at the beginning of the nineteenth century, this time scientists decided that such an animal could not exist and that the specimens were fake.

to the purpose) are ontologically different, ontologically irreducible.[30] (In this context, we can speak about the "historical" nature, and thus its changeability/development, only from the times of the "Kant-Laplace thesis").[31]

Of course, objects, things, phenomena arise, last and pass away. In this sense they have their own history. But nature has come into being (has been created) once and it still lasts. Changes are "local", "individual". In this sense, nature, although unchangeable as a whole, has its own "local" history,[32] the history of its individual components.

So, can a historical method useful in learning about immanent historical objects be useful in the study of ahistorical nature?

Using the historical method, the naturalist, philosopher, and historian not only looks for the genesis of phenomena and observed properties, but also tries to establish their chronology. However, chronology in an unchangeable (ahistorical) world is difficult to grasp and insignificant, because it is rather a chronology of discoveries than a chronology of events occurring in nature.[33] The "historical method" imposes a narrative on the cognition of nature, allows for the "historical cognition

[30] It is the perspective of Darwin that finally changes it. According to his view, nature is always "unfinished", always potential. Each stage of its history is different and open by nature, but this does not disturb its ontology. This is the ontology of the process – evolution. Admittedly, in the theory of emergence, attention is drawn to the fact that the appearance of "life" is a qualitative leap forward in relation to the inanimate world, and thus changes its ontology. But it does not change the ontology of the Cosmos – the world of quantum still remains unchanged. On the other hand, whether living organisms are also determining its ontology by changing some properties of the Cosmos is another problem. Perhaps it is the range of their influence that is decisive in this respect – it seems that it has a local character and does not change the physics of the Universe. Even if we could manipulate gravity, we wouldn't annihilate it on the cosmic scale (so we wouldn't change the ontology of the cosmos).

[31] On this subject, Cf. e.g.: Karl R. Popper, *Evolution and the Tree of Knowledge*, in: idem, *Objective Knowledge. An Evolutionary Approach* (Oxford: Clarendon Press, 1994), 268–269; Andrzej K. Wróblewski, *Historia fizyki* [History of Physics] (Warszawa: Wydawnictwo Naukowe PWN, 2009), 214, 220, 383, 554 et al.

[32] Peter J. Bowler described in this way the struggles of scientists at the turn of the eighteenth and nineteenth centuries, which would help to explain the perceived changeability and the assumed ahistorical character of nature; to explain that the changeability of nature did not have to affect its stability. Thus, they would make it possible to remove this unacceptable paradox and contradictions in the material world. The diversity of nature and its dynamics were part of a higher, transcendent and unchangeable order. But within its framework there could have been a certain freedom for the occurring phenomena and this changeability could have occurred within this order. In other words, the immanent property of this order was the possibility of changes taking place, which, however, could not violate it and could not go beyond its structure. Cf. Bowler, *The Fontana History*, chapter "The Pattern of Nature".

[33] In the unchangeable world events from the past take place according to the same mechanisms as now, unless they are an effect of a miracle (act of God).

of nature,"[34] but does not say anything about the "historical nature", constructs its history and does not discover the process of changes taking place within it. The "historical method" is therefore not necessary to study phenomena that do not have their own history. One could venture to say that the heuristic value of the way of discovering the mysteries of nature could be restored (or perhaps even generated) by the mathematical method. As I mentioned above, although criticized by empiricists, the method was not discarded by them and in comparison with experiments played only a secondary role in their methodology.[35]

However, the "historical method" has two advantages that can be indirectly conducive to the study of nature. By emphasizing the historical nature of cognition and the cumulative character of knowledge, the possibility of the emergence of new data on animals, plants, phenomena, etc. is not excluded. Thus, it is possible that previously unknown animals, plants, etc. may be revealed in the sphere of our knowledge.[36] In a sense it is a way of going beyond these "current data". However, it is not an effect of some immanent heuristics of this method, it does not necessarily imply (logically and empirically) new data.[37] But it rather associates this epistemological openness with psychological aspects, such as attitude, expectation, etc. It is therefore a phenomenon of a psychological (subjective) nature rather than a logical and empirical one.

What is more, such openness to new natural facts (discoveries, species, phenomena) and even to *oddities*[38] does not make nature changeable and thus historical. The narrative about nature may have a historical character, but not nature itself. Nature, once constituted by God, is not subject to change, development, emergence. Even after the Biblical flood, animals are not created anew; they are the result of reproductions

---

[34] Grzeliński, *Doświadczenie i rozum*, 170.

[35] The application of the mathematical method in natural sciences by Newton made it possible to accept experimental "natural history" in the contemporary methodological sense. Moreover, as Anstey adds referring to examples from history of the research on the history of sciences, one of the features of Locke's standpoint is his opposition to speculations or the method of posing hypotheses. cf. Peter R. Anstey, *John Locke and Natural Philosophy* (Oxford: University Press, 2011); M. A. Stewart (ed.), *Selected Philosophical Papers of Robert Boyle* (Manchester: University Press, 1979), 10–11.

[36] Of course, these "new" life forms cannot appear in nature. They have always functioned, since the day of creation. They are new to us, but not to nature.

[37] I mean this kind of implication, as in the case of the heliocentric theory, which "forces" the existence of, for example, the phenomenon of star parallax.

[38] This was how the content of "cabinets of oddities" was called, where interesting, exotic animals and plants were gathered, but also – more importantly – various mutated specimens, such as animals with two heads, more limbs, etc., were exhibited. This had to make the viewers realize how "creative" nature is, what kinds of organisms can inhabit previously unknown lands and the depths of seas and oceans.

of pairs preserved on the Ark. Moreover, openness to new facts does not impose a criterion for their verification – empiricism is one of the elements and since nature does not have to be subject to experimental verification, everything it contains is acceptable. Therefore, it can be expected that species (creatures) that differ in appearance from what is already known live in as yet unknown areas. However, it is impossible to explain their presence in this particular place and not in another one, or their particular appearance.[39]

Another element of the "historical method" used by Locke is related to the construction of analogies.

In order to describe and explain particular phenomena, such as the acquisition of concepts by a human being or the possession (acquisition?) of a property by any physical object, a scientist or philosopher may refer to the past; to those historical data covering the process of knowledge development, but also the functioning of nature. Thus, he or she builds an analogy between what is present and what is past, between what is given "here and now" and what is known from tradition.[40] It turns out that this is a heuristically advantageous procedure. It expands knowledge by extrapolating what is observed (and thus relatively certain) to what is past (and thus presumed, incomplete). Conversely, situations or phenomena described in the past may help in supplementing the data which are incomplete (although currently observed). Therefore, gaps in present knowledge can be filled with explanations and descriptions formulated in the past. Creating analogies helps to broaden the knowledge, not only about the past, but also about the present.

In relation to the natural world, as the scientists of the sixteenth and seventeenth centuries imagined it, creating analogies is possible and heuristically valuable in some respects. It must be accompanied by assumptions concerning the "functioning" of nature and the cognitive abilities of man. In the former case, they had to assume that nature in the past was "ruled" by the same (or similar) laws, that it functioned according to the same rules as today. Therefore, it is connected with the idea of the relative stability of its processes, mechanisms, etc.[41] Otherwise, the recon-

---

[39] Such efforts were being made already in the seventeenth century. John Ray and Francis Willoughby, in their work *Ornithologiae libri tres* [The Ornithology. In Three Books] London 1678, associated the appearance (type) of the bird with its environment and the way it obtained food. We are therefore dealing with the first ecological explanations. There was no question of adaptation, let alone changeability. This kind of relationship between the animal and the environment gave nature the quality of harmony and demonstrated God's wisdom.

[40] Of course, the texts viewed as most valuable were those of scholars such as Aristotle (and generally ancient thinkers) or "reports" containing their views.

[41] This is not about stability in some absolute sense, as we understand the stability of cosmological constants. The prolonged repeatability of phenomena, relations in ecosystems through the laws of physics, chemistry and so on, is enough.

struction of events from the past, as well as the formulated explanations of the present phenomena, would not be credible, and could even be false. Of course, there is the problem of the legitimacy of the assumption itself and the arguments in favour of recognizing the invariability of the basic laws of nature; the problem is also related to whether such assumptions refer to empirical factors or are metaphysical beliefs about nature. This seems quite obvious when we realize that these laws and their stability are in the hands of God, and even their content results from the properties of God assumed as obvious.[42]

I believe that the legitimacy of the analogy method was strengthened by comparative anatomy, which began to appear as a new element, a new method in natural sciences. The fact that natural histories were founded on humanities and empirical sciences meant that they took over not only their methodologies, but also their limitations. In order to overcome them, when studying nature scientists had to look for original solutions, which, e.g. forced them to make their own observations.[43] This could be done by comparing different animals and plants in order to indicate their similarities and differences, as well as to exclude speculation and even limit this humanistic perspective. In his *Histoire de la nature des oyseaux* (1555), Pierre Belon included a table with an illustration of a bird and a human skeleton. P. J. Bowler believes that this was an "anticipation of today's comparative anatomy".[44] Even if this was the case, no research or efforts were made to explain the similarity. Bone structures – according to the naturalists of the time – were simply created in such a way and did not have any connection with the environment. It means that it was assumed that nature does not shape them, does not affect their functions. The similarity is simply intended.

What is more, the search for similarities could be extended to extinct animals and plants, known only from fossils. The conclusions that were drawn most often were not accurate (from our point of view), but what was important was the fact that such similarities were pointed out.[45] Also the studies of animals from distant areas, often obtained in a residual,

---

[42] Descartes does so when he formulates his "laws of movement"; cf. René Descartes, *Principles of Philosophy*, part "Of the principles of material things", transl. Valentine Rodger Miller, Reese P. Miller (Dortrecht–Boston– London: Kluwer Academic Publishers, 1982), 37–78.

[43] One could say that they had to look for an "excuse" to undertake independent research, which was avoided because of the captivating power of authorities and traditions.

[44] Bowler, *The Fontana History*, 77. I am writing more on the subject in my article: "O epistemologicznych barierach w świecie niedarwinowskim" [On epistemological barriers in the non-Darwinian world], *Lectiones & Acroases Philosophicae* X, 2 (2017): 81–110.

[45] Cf. Bowler, *The Fontana History*, 82–83.

prepared form, provoked comparisons with already known organisms. This in turn made the next element of natural histories dependent on comparative anatomy.[46] It did not exclude, however, the acceptance of phenomena that differed from what was known.[47]

Despite these shortcomings, comparative anatomy made it possible to build a classification of animals and plants based on natural foundations. They did not refer to the connections and origins described by myths, legends, or "sacred texts", but to empirically established similarities. Classifications, on the other hand, were an essential element of natural history and their truthfulness also determined the credibility of the entire field.[48]

It can be said that it was a reciprocal dependence – the cognitive value of comparative anatomy strengthened the ideas of creating analogies as an element of the historical method, while the success of comparative anatomy justified analogy as a method.

But in the Renaissance and modern vision of nature, creating analogies is accompanied by a paradoxical "situational logic".[49] As the history of natural sciences makes clear, creating an analogy brings the greatest cognitive effects when it relates to a changing, dynamic reality. Therefore, its effectiveness requires a reformulation of the vision of nature functioning in modern times. This happened when pre-evolutionary ideas and Darwin's theory appeared. Only in a changing world does the "historical method" in this respect fully become a scientific method, i.e. one that forms content that can be subject to verification and falsification.[50] Its value also lies in the fact that the risk of adopting fixed laws in a changing world requires justification reaching to the most fundamental natural phenomena. It also requires a thesis that there are "levels" of matter in which unchangeable/fixed rules apply.

The best example to support this thesis – taking into account the methods it uses and the content it formulates – is the contemporary paleontology. Paleontology (but also geology, as well as anthropology, archaeology, ethnology, and the historical sciences in general) would not be so rich in content and explanation were it not for the analogies that were created. As a result, this discipline formulates knowledge about nature, its functioning, and history, going beyond the directly accessible, often residual data about its past. Having at their disposal fragments

---

[46] Cf. ibidem, 249.

[47] Cf. the remark concerning the paradise birds. Their biological existence required a vision of nature in which, although the laws of physics, chemistry, and biology were in force, they did not exclude the existence of birds without legs, dragons, etc.

[48] Cf. Bowler, *The Fontana History*, 258–261, 186 et al.

[49] I take the liberty of using the words of Karl R. Popper.

[50] It is also the most risky one, i.e. it meets the postulate of Popper and Lakatos.

of bones, skeletons, coprolytes, fossilized prints (feathers, footprints, traces), scientists reconstruct not only the appearance of an animal or plant, but also its environment, ecology, and even its behaviour – hunting, mating (and, in the case of people, also connected with art). Thus, it reproduces prehistoric reality in many aspects (dimensions). The credibility (truthfulness) of such knowledge depends on the credibility of the content formulated by other disciplines that help shape it, on the effectiveness of the methods they use, and on their methodology. Contemporary paleontology depends not only on geology (as in the times of Darwin), which in addition, at the beginning of the twentieth century, due to Wegener's theory, underwent revolutionary changes. It also depends on physics and chemistry, on ecology, on astronomy, and cosmic factors (Alvarez's theory), but also on technology, including information technology. And this means that the rejection (falsification) of the content formulated by paleontology would also have to undermine the laws, theories, and methods of many other sciences.

Conclusion

Until the time of Darwin's theory, nature was considered ahistorical and did not form a coherent whole the way we understand it today. Naturalists did not see it as an ecosystem, a biome, or ultimately a biosphere.[51] It was perceived "point-by-point", and the individual elements did not have to be linked to each other. Comparative anatomies were a kind of attempt to provide nature with a degree of cohesion, but they did not exclude exceptions, either – both paradise birds and *oddities* were seen as real. This was because there was no reference to the universal laws of physics and chemistry, and the laws of biology and ecology had not yet been formulated. Possible homogeneity did not arise from the internal properties of matter, which in turn could be the object of experience. The rejection of mutually exclusive facts (events, states of nature, but also legends about animals, the existence of which would undermine these laws) would therefore be internally motivated, and not dependent on authorities, traditions, religions, etc., The "historical method" proposed by Locke was supposed to be the remedy for this, and "natural histories" would be the model of knowledge about nature, which should eliminate these contradictions and gaps in a "historical manner". In this context, however, the "historical method" turns out to be a method

[51] Paradoxically, this holistic approach to nature made it possible to build a vision of nature that restored (and rehabilitated) its alchemic and even mythical face. I mean here the "Gaia hypothesis" (and the opposing "Medea hypothesis", which its creator Peter Ward proposed as a provocative and ironic response to Lovelock's concepts).

of supplementation. In order to eliminate these gaps and the resulting state of natural sciences, it was necessary to reject this vision of nature, rather than fill in the gaps in the content of natural sciences.

The "historical method" makes it possible to construct science about nature, to "learn about nature in a historical way", but not to get to know nature itself. It involves collecting observations,[52] as well as information on how to organize and even conduct them. It is therefore a method of organizing science/knowledge, but not a method of acquiring content, a method that would allow to discover, predict, and explain natural phenomena.[53] Still, as it has been stressed, it makes it possible to broaden the knowledge about nature under certain conditions. Therefore, it is not an alternative to mathematics, nor to experience and experimentation. The empiricism of this method is limited to the observation of mechanisms of acquiring the concepts and mechanisms of constructing knowledge. Thus, it is a "history of knowledge about the environment" (paraphrasing the title of Bowler's book, *The History of Environmental Sciences*), not the "history of the environment". This is because nature did not have its own history, and if we may talk about history in nature at all, it is the history of events in the local, individual dimension. So is the story of life of every organism that has its own history because it is unique.

Perhaps this is the reason why Locke performs a methodological (and philosophical) reevaluation over time. As described by Przemysław Wewiór: "In *An Essay*, natural history was the objective of research, and hypotheses were only a means to achieve it, whereas in his *Of the Conduct of the Understanding*, history has a subordinate function, and general philosophical principles are the destination of scientific research".[54] Does this mean that the historical view loses its cognitive value? Certainly not. But, as Wewiór emphasizes, under the influence of Newton's *Principia*, Locke turns to a method that makes it possible not only to create knowledge about nature, but above all to discover the principles that constitute it. These are "mathematical principles", which must be connected with the "philosophy of nature". Their discovery makes it possible to truly know nature, and not only to construct knowledge about it.[55]

---

[52] Grzeliński, *Doświadczenie i rozum*, 175.

[53] In the sixteenth and seventeenth centuries, a number of works were published in the form of textbooks. They were the ones to organize, systematize, and classify achievements in a given field. They were even reporting, documentary in nature. Cf. for example: *Pyrotechnia*, (1540) by Vannoccio Bringuccio, a work on casting, metalworking, and metallurgy; *De re metallica*, libria XII, (1556) by Georgicus Agricola, dedicated to metallurgy.

[54] Wewiór, "Wstęp tłumacza", 133.

[55] It should be stressed that Locke's position on the content and method of the Principia (and probably also Newton's own opinion) should be seen in the context of Descartes' *Principles of Philosophy* written forty years earlier. The influence

* * *

One more reflection to conclude these observations. The acceptance of the primacy of the method over the object of cognition has its methodological and epistemological consequences. They concern the relationship between the method of cognition and the content (as well as the object of cognition) which, thanks to this method, can be formulated.

Karl Raimund Popper[56] pointed out that one cannot disassociate the considerations concerning the method from the object of cognition. An appropriate method not only makes it possible to depict the object of cognition, but also determines this method and cognitive effects. The object of cognition appears as the method allows it. In other words, the object of cognition is in a sense "dissected" by the method. A certain coherence between the "historical method" and the knowledge of nature ("natural history") is revealed in the case of the theory of evolution. As biologists and philosophers of science point out, the immanent property of this theory is that it has a historical character.[57]

Furthermore, contemporary reflection on science dispels a certain naïve belief in the possibility of constructing not only a universal scientific method (although nowadays a certain universal model of such a method exists in the natural sciences), but also in some superhuman power and cognitive effectiveness of those scientists equipped with this method. K.R. Popper wrote many times that "whatever method we use, we have little chance of discovering true laws, and our theories contain many mistakes".[58]

In order to avoid such mistakes, philosophers and naturalists undertook the effort to reformulate the basic principles and mechanisms according to which knowledge functioned, in particular in the field of nature and philosophy.

---

of Newton on the philosophical and methodological views of Locke were analyzed in many works. At least two of them should be referred to here: Colin Pask, *Magnificent Principia* (New York: Prometheus Books, 2013), e.g. 27, 346–347, 486; Anstey, *John Locke*.

[56] Karl Popper, "Epistemology without a Knowing Subject", in: idem, *Objective Knowledge*, 106–152.

[57] Idem, Evolution and the Tree of Life, in: ibidem, 256–284. Cf. Ernst Mayr, *This is Biology. The Science of the Living World* (Cambridge, Mass.–London: The Belknapp Press of Harvard University Press, 1998), in particular the chapter "How Does Biology Explain the Living World?", 64–78.

[58] Karl Popper, "Wiedza obiektywna" [Objective Knowledge], in: idem, *Wiedza obiektywna*, transl. Adam Chmielewski (Warszawa: PWN, 2002), 22.

Bibliography

Anstey Peter R. 2011. *John Locke and Natural Philosophy*. Oxford: University Press.

Bacon Francis. 2000. *The New Organon*, ed. Lisa Jardine and Michael Silverthorne. Oxford: Oxford University Press.

Bowler Peter J. 1992. *The Fontana History of the Environmental Sciences*. London: Fontana Press.

Boyle Robert. 1661. *The Sceptical Chymist*. London.

Bronowski Jacob, Bruce Mazlish. 1960. *The Western Intellectual Tradition. From Leonardo to Hegel*. New York and Evanston: Harper & Brothers.

Descartes René. 1982. *Principles of Philosophy*, transl. Valentine Rodger Miller, Reese P. Miller. Dortrecht–Boston–London: Kluwer Academic Publishers.

Descartes René. 2003. *Discourse on the method*, transl. Elisabeth S. Haldane and G. R. T. Ross. Mineola–New York.

Grzeliński Adam. 2016. "Dwa wczesne eseje medyczne Locke'a". *Studia z Historii Filozofii* 1/7: 105–121.

Grzeliński Adam. 2018. "'Rozważania dotyczące rozumu ludzkiego'" Johna Locke'a: teoria poznania i historia". In: *Rozum, człowiek, historia*, ed. Jakub Szczepański, 163–181. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.

Grzeliński Adam. 2019. *Doświadczenie i rozum. Empiryzm Johna Locke'a*. Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika.

Locke John. 1975. *An Essay concerning Human Understanding*, ed. Peter H. Nidditch. Oxford: Oxford University Press.

Mauersberger Georg. 1999. *Ptaki*, various translators. Warszawa: Muza SA.

Mayr Ernst. 1998. *This is Biology. The Science of the Living World*. Cambridge, Mass.–London: The Belknapp Press of Harvard University Press.

Pask Colin. 2013. *Magnificent Principia*. New York: Prometheus Books.

Pietrzak Zbigniew. 2017. "O epistemologicznych barierach w świecie niedarwinowskim", *Lectiones & Acroases Philosophicae* X, 2: 81–110.

Pietrzak Zbigniew. 2018. "Historia naturalna a wiedza o naturze". In: *Rozum, człowiek, historia*, ed. Jakub Szczepański. 183–202. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.

Popper Karl. 1994. *Objective Knowledge. An Evolutionary Approach*. Oxford: Clarendon Press.

Popper Karl R. 1992. *Wiedza obiektywna*, transl. Adam Chmielewski. Warszawa: PWN.

Ray John, Francis Willoughby. 1678. *Ornithologiae libri tres*. London.

Rogers John G. A. 1979. "Locke, Newton and the Enlightenment". In: *Vistas in Astronomy* 22, 471–476.

Spinoza Benedict de. *Ethics*, transl. R. H. M. Elwes. https://www.gutenberg.org/files/3800/3800-h/3800-h.htm; access: 24.12.2019. Access: 24.12.2019.

Stewart M.A. 1979. "Selected Philosophical Papers of Robert Boyle". Manchester: University Press.

Wewiór Przemysław. 2011. "Wstęp tłumacza do 'Zasad filozofii przyrody' Johna Locke'a". *Studia Philosophica Wratislaviensia* IV, 3: 123–136.
Wróblewski Andrzej K. 2009. *Historia fizyki*. Warszawa: Wydawnictwo Naukowe PWN.

Summary

The seventeenth-century dispute between rationalists and empiricists concerned, among other things, the methods of acquiring and organizing knowledge and, consequently, the methods of reaching the truth.

The confrontation of these two fundamental positions influenced the development of the model of natural sciences. The choice between their mathematization and establishing them on the basis of an experimental method revealed the philosophical aspect of the understanding of nature – the philosophy of nature. John Locke, criticizing the mathematical approach to nature and not being an empiricist like Francis Bacon or Robert Boyle, proposed yet another path: "the plain, historical method". The method is based on the idea that while searching for the sources of our cognition – that is, the presence of concepts in our mind – it describes the process or the history of their acquisition.

The main problem I raise in my paper is whether Locke's methodological proposal can have a practical meaning in the process of building natural knowledge – "natural history".

Keywords: historical method, natural history, knowledge, science.

Ministry of Science and Higher Education
Republic of Poland

Financed by MNiSW on the basis of agreement no. 655/P-DUN/2019 (dated May, 7, 2019). Project 2: "Publishing four issues of 'Ruch Filozoficzny' quarterly in English over the period 2019–2020; vol. LXXV – issues 2 and 4 (2019); vol. LXXVI – issues 2 and 4 (2020)"; amount from the DUN grant: 35 200 PLN.