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## DESCARTES' "RADICAL" RATIONALISM? ON THE HISTORY OF THE THEORY OF SCIENCE<sup>1</sup>

The opposition "rationalism-empiricism" makes the basic backdrop against which to present the history of epistemology that occupies the central place in the middle stage of the history of modern philosophy, that is, in the seventeenth and eighteenth centuries. We owe it mainly to I. Kant<sup>2</sup> that this opposition was made present in philosophical historiography. Obviously, he had some predecessors, among others, F. Bacon who in turn took it over from Aulus Cornelius Celsus' Roman encyclopaedia. Celsus, like Claudius Galen and Sextus Empiricus, distinguished in ancient medicine between empiricists and rationalists. At any rate he regarded these two approaches as one-sided, and postulated their creative combination.<sup>3</sup>

This interpretative scheme has taken roots in the manuals on history of philosophy since the times of F. Ueberweg. The latter put the opposition dogmatism-scepticism together with the opposition rationalism-empiricism.<sup>4</sup> With time, those categories had lost their evaluative character determined by Kant, who stressed their one-sidedness, and took on a descriptive and ordering character. The latter served to define the two types of the philosophies in the seventeenth and eighteenth centuries. They were taken in combination, as it is in B. Russell's historiography (*History of Western*

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<sup>1</sup> I use the category "empiricism" above all in the sense of genetic empiricism and, to a certain extent, also in the sense of methodological empiricism, since the concept "rationalism" to define methodological rationalism, also partly genetic, i.e. in the sense of aprioricism.

<sup>2</sup> After *Epirismus*, in: *Historische Wörterbuch der Philosophie*, vol. 2 (ed. J. Ritter), Basel 1972, p. 478.

<sup>3</sup> After H.-J. Engfer, *Empirismus versus Rationalismus? Kritik eines philosophiegeschichtlichen Schemas*, Paderborn 1996, p. 19-21.

<sup>4</sup> F. Ueberweg, *Grundriss der Geschichte der Philosophie*, vol. 3. *Die Neuzeit bis zum Ende des achtzehnten Jahrhunderts*, ed. M. Heinze, Berlin 1883, p. 43.

*Philosophy*). Russell linked rationalistic tradition with Descartes at the lead and Locke's empiricism.<sup>5</sup> J. Hirschberger did a similar thing, as he presents jointly the seventeenth and eighteenth centuries ("Die Systeme des 17. und 18. Jahrhunderts"), and grouped together the philosophers of that period in two paragraphs: "Der Rationalismus" and "Der Empirismus."<sup>6</sup> In Polish historiography, although W. Tatarkiewicz and Z. Kuderowicz,<sup>7</sup> stick to the chronological scheme, it is J. Woleński who in a historical outline would describe the history of this period and would use also the rationalism–empiricism scheme.<sup>8</sup>

Indeed, it is difficult to say that this scheme has no operative value in order the matter on hand, or that it does not have a number of substantive arguments that justify its validity, we cannot, however, fail to notice that there are problems to apply in an unambiguous manner. H. J. Engfer pointed to this issue in German literature, but Polish technical literature clearly understates this question. We shall limit ourselves to signal only some difficulties in classifying Descartes, who had unanimously been defined a typical rationalist. Descartes had overall accomplishments, i.e., not only in the field of epistemology and metaphysics, but also in natural philosophy. They are forgotten today, but were appreciated still in mid-eighteenth century, let alone by such an important person for the Enlightenment science as J. le Rond d'Alembert.<sup>9</sup>

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R. Descartes<sup>10</sup> attaches much weight to a proper scientific method. He states dramatically that it is better to give up learned activity than

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<sup>5</sup> B. Russell, *History of Western Philosophy and Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day*, 1946, 1955.

<sup>6</sup> J. Hirschberger, *Geschichte de Philosophie*, vol. 2. *Neuzeit und Gegenwart*, Freiburg 1952, 1991.

<sup>7</sup> Z. Kuderowicz, *Filozofia nowożytniej Europy* [Philosophy of Modern Europe], Warszawa 1989.

<sup>8</sup> J. Woleński, *Epistemologia* [Epistemology], vol. 1. *Zarys historyczny i problemy metateoretyczne* [A Historical Outline and Metatheoretical Problems], Kraków 2000; the same, *Epistemologia. Poznanie, prawda, wiedza, realizm* [Epistemology. Knowledge, Truth, Knowing], Warszawa 2005.

<sup>9</sup> See S. Janeczek, *Teoria nauki w ujęciu J. le Ronda d'Alemberta. Między empiryzmem, racjonalizmem i intuicjonizmem* [The Theory of Science According to J. le Rond d'Alembert. Between Empiricism, Rationalism and Intuitionism], in: *Philosophia vitam alere. Prace dedykowane Profesorowi Romanowi Darowskiemu SJ* [The Works Dedicated to Professor Roman Darowski SJ], Kraków 2005, p. 199–212.

<sup>10</sup> I am using the edition *Oeuvres de Descartes*, ed. Ch. Adam, P. Tannery, Paris 1897–1913 (repr. 1996).

to continue it without a respective method.<sup>11</sup> As it is commonly known, the basic recommendations of this method modelled mainly on mathematics are reduced to determine certain conditions of infallible knowledge, that is, above all clarity and distinctness that would be a test of self-evidence, treated as a necessary and sufficient condition to approve of axioms and proofs, and that with regard to each step of demonstration. The method was supposed to be certain, easy, fertile, and complete. It refers to mathematics that integrates intuition with deduction, that relies on intellectual intuition that fulfils the requirement of immanent self-evidence understood in the sense of subjective self-evidence, for it is only what is clear and distinct that is approved as true. The method is supposed to be useful with regard to the simplest truths (axioms) by way of analysis and reduction, and in the creation of the mental series that satisfy the requirement of self-evidence.<sup>12</sup> This analytical, intuitive and deductive procedure postulated by Descartes was borrowed from mathematics, and it would become for many thinkers – in combination with various epistemological additions – characteristic of the rationalistic trend in modern philosophy.

At the same time, however, one cannot fail to notice in Descartes' methodology some elements characteristic of the then natural philosophy, therefore some traces of inductive and hypothetical thinking. They were not perceived by Descartes' proponents as well as by many scholars of his legacy, by those who stressed above all its a priori deductionism. The latter qualification is opposed especially by many contemporary specialists in Descartes. They stressed the "complete" character of his texts on the theory of science, or at least its "ambiguities" in determining the fundamental laws of nature, which he sought to formulate in the *Principia philosophiae*.<sup>13</sup> Pointing at some difficulties in distinguishing a coherent sense of methodological considerations, he emphasises, like e.g. Desmond M. Clarke, that Descartes's method is a peculiar "mix of conceptual analysis, empirical corroboration

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<sup>11</sup> R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. 10, p. 375–377. Cf. *ibid.* p. 371–372. See L. J. Beck, *The Method of Descartes. A Study of the Regulae*, Oxford 1952, p. 172–189.

<sup>12</sup> See Janeczka, *Logika czy epistemologia? Historycznofilozoficzne uwarunkowania nowożytnej koncepcji logiki* [Logic or Epistemology? Historical and Philosophical Conditions of the Modern Conception of Logic], Lublin 2003, p. 181–217. Cf. E. Morawiec, *Przedmiot a metoda w filozofii Kartezjusza* [Object and Method in Descartes' Philosophy], Warszawa 1970.

<sup>13</sup> See S. M. Nadler, *Deduction, Confirmation, and the Laws of Nature in Descartes's "Principia Philosophiae"*, "Journal of the History of Philosophy" 28:1990 no. 3, p. 359.

and metaphysical explanation.”<sup>14</sup> He states that experience will turn out indispensable at least at the suprarational level of natural considerations,<sup>15</sup> therefore – as Daniel Garber notes – when rational laws are referred to the explanation of concrete phenomena,<sup>16</sup> for “experience is an essential part of the method for constructing a deductive science.”<sup>17</sup> Such a vision of Descartes’ work diverges from the tradition to treat him as the father of modern epistemology and metaphysics. Without ignoring the arguments on behalf of such interpretation, he was above all a scholar who sought to formulate a new and integral vision of the world in which natural science would play an essential role, and which would be competitive to scholastics as it would combine metaphysics with natural science. Far from belittling the ideological importance of metaphysics that Descartes himself valued,<sup>18</sup> it seems that to a great extent it played an ancillary role towards natural science by laying its rational foundation.

Inasmuch as Descartes dwelt on the method used in philosophy that allowed him to formulate the principles of metaphysics,<sup>19</sup> the procedures postulated in reference to natural science may only be reconstructed by referring comparatively to the then methodological statements. On the grounds of universal method, adjusted to the introduction of metaphysical categories, he meant to reduce, by way of analysis, the data gathered from experience – the data that appeared first to be complicated and unclear – to simple and clear properties. Then they could become objects of an intuitive act and thereby could be grasped as certain, or follow from such theorems that concern the nature of thoughts or extension. A further stage was to explain the whole of experience data by demonstrating that they could be deduced from those simple natures.

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<sup>14</sup> D. M. Clarke, *Descartes’ Philosophy of Science. Studies in Intellectual History*, Manchester 1982, p. 97. Cf. B. Williams, *Descartes. The Project of Pure Enquiry*, Middlesex 1978, p. 268.

<sup>15</sup> Ch. Larmore, *Descartes’ Empirical Epistemology*, in: *Descartes. Philosophy, Mathematics and Physics*, (ed.) S. Gaukroger, Sussex 1980, p. 6–22.

<sup>16</sup> D. Garber, *Science and Certainty in Descartes*, in: *Descartes. Critical and Interpretative Essays*, (ed.) M. Hooker, Baltimore 1978, p. 114–151, especially p. 141.

<sup>17</sup> D. Garber, *Descartes’ Method and the Role of Experiment*, in: *Descartes*, (ed.) J. Cottingham, Oxford 1998, p. 234. Cf. the same, *Descartes’ Metaphysical Physics*, Chicago 1992; the same, *Descartes Embodied. Reading Cartesian Philosophy through Cartesian Science*, Cambridge 2001.

<sup>18</sup> See e.g. Z. Janowski, *Teodycea kartezjańska [Cartesian Theodyce]*, Kraków 1998.

<sup>19</sup> See e.g. A. C. Crombie, *Augustine to Galileo. The History of Science, A.D. 400–1650*, vol. II, *Science in the Later Middle Ages and Early Modern Times, 13<sup>th</sup>–17<sup>th</sup> Centuries*, London 1961, p. 305–306.

In natural science, however, it seems that Descartes accepted a much more complicated way. On the one hand it drew on to Bacon's methodological considerations, and on the other to the methodological procedures postulated and applied by Galileo. Those procedures were only enriched by a systemic interpretation characteristic of philosophy that is in fact foreign to the typically "scientific" Galileo's approach, one that is concentrated on the explanation of the nature and causes of particular phenomena, and that is different from Bacon's mainly encyclopaedic approach. Although Descartes distanced himself from history as a purely erudite knowledge that is a synonym of the knowledge based only on authority. He opposed it to demonstrative knowledge modelled on mathematics<sup>20</sup> on *historia naturalis*, and not only modern scholars, including Aristotle. In his letters to M. Mersenne, whom he informs in detail about the integral approach to physics, we find some information that he is an avid reader of F. Bacon's,<sup>21</sup> a trace of which is his use of Bacon's expressions,<sup>22</sup> learns about Gassendi's experiences,<sup>23</sup> and asks Mersenne to send him some important works on natural science.<sup>24</sup> He appreciates the meaning of an ordered natural history that make research on typical phenomena, thus such that are regarded as certain and useful, contrary to some uncertain discoveries of natural peculiarities.<sup>25</sup> Hence he uses some extracts from Aristotle's natural writings made by Mersenne and he himself makes notes on Bacon's writings, and makes observations of nature (e.g. stunning with the anatomy of animals). Both in his approach to natural philosophy and in his postulate to explain its data one may notice the same postulate we find in the universal method to achieve clarity of knowledge, safeguarded by the simplicity of the subjects under study.<sup>26</sup>

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<sup>20</sup> Descartes does not hide his unwillingness to book knowledge (*Oeuvres de Descartes*, vol. I, p. 221). This will be seen especially when he presents the history of his education, putting it within the frameworks of erudite knowledge ("book knowledge" – "science des livres") including both linguistic and humanistic subjects, therefore rhetoric with poetry, history with geography, ethics with law, and the natural sciences with medicine. R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. X, p. 367; the same, *Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 5–7, 12. See L. Lévy-Bruhl, *Cartesian Spirit and History*, in: the same, *Philosophy and History*, Oxford 1936, p. 193.

<sup>21</sup> *Oeuvres de Descartes*, vol. I, p. 195–196.

<sup>22</sup> *Oeuvres de Descartes*, vol. I, p. 318; see also the editor's note from p. 321.

<sup>23</sup> *Oeuvres de Descartes*, vol. I, p. 112, 148.

<sup>24</sup> *Oeuvres de Descartes*, vol. I, p. 103, 250.

<sup>25</sup> *Oeuvres de Descartes*, vol. I, p. 196.

<sup>26</sup> *Oeuvres de Descartes*, vol. I, p. 109. Cf. L. Chmaj, *Rozwój filozoficzny Kartezjusza* [Descartes' Philosophical Development], Kraków 1930, p. 160–162.

The application of such requirements will turn out more difficult in natural science than in mathematics and metaphysics. In the first and in the second case we are obliged by the fundamental postulate to preserve order (“ordo”), a fact that calls for continuous analysis, treated as a broadly comprehended disposition (“dispositio”) recommended in synthetic principle V.<sup>27</sup> This requirement equally deals with the formulation of the foundations of knowledge and the procedures made real in particular sciences. In the second case this disposition will deal with data gathered in experience. He will recommend it to philosophers, broadly understood, and to astronomers (astrologers) and mechanics.<sup>28</sup> The analytical ordering will take the form of “stairs” that remind Bacon’s induction. Following these stairs, we gradually build the edifice of knowledge and avoid chaotic researches. The ultimate explanation of phenomena will be possible only in science that is deductively ordered, e.g. mechanics must refer to the principles of physics, and the knowledge of the “nature” of nests will ensure the knowledge of their “results”.<sup>29</sup> In the heuristic aspect science is a peculiar game of theory and experiments: in the first case the essential role is played by hypotheses defined as “presumptions.”

Descartes describes his own methodological position (“I hold on to this order”) first of all as being in line with the deductionistic ideal of science, therefore he stresses the role of the basic principles of nature (“general les principes ou premieres causes”), starting from the formulation of its essence reduced to the idea of extension, shape, and movement. He referred therefore to a priori truths (innate), for “only” these “certain truths ... are found in our souls.” It is from them that one should deduce, on the principle of the cause-effect relationship, the principles characteristic of all material bodies, which means the discovery of the nature of the substrate of earthly bodies. All these principles, defined as first and most common effects (“les premieres et plus ordinaires effects”) that were supposed to satisfy the condition of certainty, for they were “the most common and simplest of all, thus they were easiest to be known,” therefore they were accessible by way of intuition and deduction characteristic of the universal method.

Only in reference to the more specific phenomena was Descartes to revert the principles of this method, that is “to find the causes by way of the

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<sup>27</sup> R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. X, p. 379–380.

<sup>28</sup> Cf. A. Gewirtz, *Experience and the Non-Mathematical in the Cartesian Method*, “Journal of the History of Ideas” 2:1941, p. 183–210.

<sup>29</sup> R. Descartes, *Regulae ad directionem ingenii*, in: *Oeuvres de Descartes*, vol. X, p. 379–380.

effect and use many detailed experiences." Undoubtedly, the departure from his preferred method can be accounted for by his inability to distinguish by a purely mental manner "the forms or species of bodies on the earth from the innumerable variety of others that could be found there, if God willed to place them there." Therefore it is impossible to verify which of the "possible" bodies really exist. This change of method is, however, clearly enforced if it states that the human mind cannot exemplify the basic explaining principles by other means ("and adjust them to our use"). In this respect it is necessary to refer to some "detailed experiences" that were supposed to make us sure as to the laws formulated by way of a priori. At the same time he reviewed ("repasser") all the objects that he ever found by way of his senses. This review made him sure that "he failed to notice among them any thing that could not easily explain by means of the principles he discovered." Therefore from the very beginning the study of physical phenomena had a twofold character. Irrespectively of this intuitive and deductive series, that made it possible for him to discover the first metaphysical principles, and then physical principles, analysis specifically understood would seem indispensable. This analysis would make it possible to reach the simplest, therefore the principles of metaphysics, starting from those series that classify the most typical phenomena in nature. At this level Descartes reveals the role of experience that not only confirms what is well-known by way of internal mentality. It is in this sense that it serves to show such phenomena to which it refers as a simple simplification of the principles perceived in the extraobjective world. It is also a synonym, be that only introductory, of the systematisation of natural phenomena.<sup>30</sup>

The logic perceived in his lecture on the model of the Cartesian method manifests undoubtedly the preference for a priori and deductive procedures, therefore putting metaphysics superior to physics. No wonder then that Descartes, as it were, hides the undoubted accessions on behalf of inductive and hypothetical thinking, taking them in the categories of the first approach of the two. Even breaking the deductive series of considerations he is forced to admit the necessity to refer to experiences in order to attach a definite effect to its respective cause. Here we can find a manifestation of the use of empirical verification, then this procedure would be taken in deductionistic categories because in the form of deducing ("déduire") effects form their causes.<sup>31</sup>

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<sup>30</sup> R. Descartes, *Discourse de la méthode*, in: *Oeuvres de Descartes*, vol. 6, p. 63–64.

<sup>31</sup> R. Descartes, *Discourse de la méthode*, in: *Oeuvres de Descartes*, vol. 6, p. 64–65.

The deductive character of Cartesian analyses was ultimately supported by the a priori character of his considerations on physics. Thereby he could deduce, as he assured us, all the phenomena (“what concerns seeing, salt, winds, clouds, snow, thunderbolt, rainbow, and things of this kind”) from the causes indicated by him.<sup>32</sup> The basic thesis was the truth about the bodies that are composed of parts, from which he deduced a thesis that bodies are infinitely divisible. This thesis is also understood as the belief that they are extensive, the fact that Descartes treated as approaches so simple that called for no definition. These theses conditioned uniformity in material nature. This uniformity was so thorough that from this matter each of the possible worlds would have to be built. The specific character of nature was ultimately reduced to divisiveness and movement, an expression of consequent mechanicism.<sup>33</sup>

The combination of a priori and deductive considerations with experiment made it possible to attribute a particular phenomenon to one of its many causes. These causes were found by a purely mental way, most obviously by trial and error (a cross experiment), and it was consequently the character of verification. This uniformity was broken, however, by his resolution to apply suppositions, a fact that is found in his writings on nature published together with *The Discourse on Method*, that is, in *Dioptrics* and *Meteors*.<sup>34</sup> A careful reading of those writings was supposed to “satisfy” the reader, i.e. the theses announced there had been demonstrated according to the standards of the postulated method. This statement may be partly understood in the sense of fictional considerations, assumed by Descartes for pragmatic reasons. He signalled it already in *The Discourse on Method*, where he indicated that in order to freely conduct considerations, without the then paradigms, and stay consequent, avoid disputes that would result from a need to defend one’s position that questions common beliefs, he would leave for traditional philosophers of nature the analyses on the real world. And he “speak only about what would happen in a new world.”<sup>35</sup> Using these suppositions, however, was first of all a manifestation

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<sup>32</sup> *Oeuvres de Descartes*, vol. II, p. 200.

<sup>33</sup> R. Descartes, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part 1, p. 52–53.

<sup>34</sup> R. Descartes, *Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 76.

<sup>35</sup> R. Descartes, *The Discourse on Method*, p. 51; the same, *Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 42. He referred to a fictional formulation anticipating thereby his metaphysical considerations, when he defined *Discours de la méthode* as “only a history” (“une histoire”), or even if one prefers, as a parable (“une fable”) in which one finds among examples that can be imitated many others that we should rightly hold on to”

of the application of modern inventive procedures. They presumed a specific game between experiment and theory, the game ultimately verified by way of experiment. The theory here was conceived as a manifestation of the rational and systemic approach. Descartes criticised Galileo's research practice. His criticism indicates the integral character of the two elements of scientific method of natural philosophy. Although he praised Galileo's "philosophy" in letter to Mersenne (*Discorsi e dimonstrazione matematiche intorno due nuove scienze*, Lugdunum Batavorum 1638) that it was better than other average philosophies, rejected errors of Aristotelianism. He praised it for the application of mathematical method, treating the latter as the only way to discover the truth, and yet "he built without foundations." Without indicating the first causes of nature, he limited himself to the explication of only particular phenomena by pointing to their respective reasons, that is, without building the whole system of physics. Writing, for instance, about the scales and lever he would therefore explain what is happening (*quod ita fit*), but why this is happening (*cur ita fit*), what Descartes was supposed to do in his *Principia philosophiae*.<sup>36</sup> No wonder then that A. C. Crombie would define his research attitude in physics as an approach characteristic of the philosopher who, as in the whole of science, seeks here the first "simple" natures like extension and movement in physics to which he added, as the consequences of the first: shape and set of elements. Crombie stressed the primacy of Descartes' operations that dealt with the formulation of universal method that made it possible to retain the unity of knowledge, especially by emphasising the role of its fundamental

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(*Discours de la méthode*, in: *Oeuvres de Descartes*, vol. VI, p. 42), and on the grounds of physical considerations, where in the beginning of his treaty *On Light* he modestly assures that in order to avoid this consideration being boring he presented a part of it in the form of a tale ("dans l'invention d'une fable"). Being a tale it does not lose its character of demonstration (*Oeuvres de Descartes*, vol. XI, p. 31). A true reason for his operations would be given in a letter to Mersenne, where he states that in the then circumstances it was not possible to lecture any other philosophy than Aristotelianism. It was fused almost entirely with a lecture on theology "so that it should not in advance look contrary to faith" (*Oeuvres de Descartes*, vol. I, p. 85–86; see L. Chmaj, *Descartes' Philosophical Development*, p. 157–158). At the same time Descartes made every effort that his view be accepted, a proof of which we can find in his correspondence with the then authorities, e.g. the letter to Sorbone professors that precedes his *Meditationes de prima philosophia*. Counting on their acceptance, he would mention in the first edition that he received it, a fact that is absent in a further edition. Despite some support from, among others, G. Gibieuf, his friendly oratory father, he did not receive it (F. Alquié, *Descartes. L'Homme et l'oeuvre*, Paris 1969, p. 72). Alquié presumes that by publishing his *Principle of Philosophy* he hoped to popularise his physics, or even to introduce it in education (F. Alquié, *Descartes. L'Homme et l'oeuvre*, p. 118). His *Principles* bore a scholarly character, their lecture is not continuous, instead we find short and numbered paragraphs.

<sup>36</sup> *Oeuvre de Descartes*, vol. II, p. 380, 433.

statements obligatory in the whole system of knowledge. In this manner Descartes is different from Galileo who, according to Crombie, was supposed to treat movement on the part of mathematical descriptions, without a philosophical base in which it would find explication. The more so, it was Descartes who was the first to have formulated the whole vision of mechanistic philosophy being at the same time mechanistic physics. This philosophical approach led him to speculation, an example of which the a priori theory of whirls, with the conception of three kinds of matter,<sup>37</sup> understood as a consequence of the laws of mechanics that was not confirmed in experience.

Despite this actual rationalistic a priori approach at least the late Descartes would notice that it was inevitable to introduce hypothetical procedures in the mechanistic vision of physics. They were strengthened in the causal-consecutive categories in which the role of experience was made precise. Its role was supposed to be revealed at many levels and ultimately demonstrated that the principles formulated by physics corresponded with the laws of nature.<sup>38</sup> Empirical verification was indeed woven with the kind of thinking that was grasped in the categories of a model,<sup>39</sup> therefore hypothetical operations, especially if we take into consideration the fact that putting aside the rigours of indubitable knowledge, and being governed by pragmatic reasons, he would even allow for the use of hypotheses of which he knew they were false.<sup>40</sup>

Despite the principal emphasis on the role of intuitive-deductive procedures in science, Descartes must therefore agree to the multilevel character of the certainty of his theses in his system, for in *The Medita-*

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<sup>37</sup> R. Descartes, *Principia philosophiae*, in: *Oeuvre de Descartes*, vol. VIII, part 1, p. 100–105.

<sup>38</sup> See A. C. Crombie, *Augustine to Galileo. The History of Science, A.D. 400–1650*, vol. II, p. 162–163, 197–199, 303–304.

<sup>39</sup> A. R. Hall, *The Scientific Revolution 1500–1800. The Formation of the Modern Scientific Attitude*, London 1954, p. 178–185.

<sup>40</sup> Descartes justifies the application of hypotheses to which he had no doubts whether they were true. He demanded only that the conclusions introduced by their means should be confirmed by experience. Ultimately, they should serve to control nature (R. Descartes, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part 1, p. 99). What is more, he even allows for putting forward hypotheses of which he knew they were false. When he responded to Gassendi's objection he said that in order to explain the truth one often assumed false things to be true. R. Descartes, *Meditationes de prima philosophia*, in: *Oeuvres de Descartes*, vol. VII, p. 349; cf. the letter to Morin of 1638, *Oeuvres de Descartes*, vol. II, p. 197. See also: the same, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part I, p. 99–100; the same, *La Dioptrique*, in: *Oeuvres de Descartes*, vol. VI, p. 83; the same, *Les météores*, in: *Oeuvres de Descartes*, vol. VI, p. 233; the same, *Le Monde*, in: *Oeuvres de Descartes*, vol. XI, p. 33.

tions on the First Philosophy it turned out that the basic theses of metaphysics are more certain than mathematical truths. If one, however, attributes the principal role to experience at the starting point of physical analyses, or even that it was supposed to decide about the choice of one among many explications formulated by way of a priori hypotheses, although also with the use of experience, since on the principle by trial and error. Then at least in comparison with the certainty of metaphysical truths of physics they must remain, by necessity, only hypothetical, from which – as it was shown above – he excluded only the most general questions.<sup>41</sup> Thus the opinion formulated years ago by I. Dąb-ska seems justified. She indicated that Descartes operated with two models of methodology, that is – as it were – official models explained in the *Regulae ad directionem ingenii*, *Discours de la méthode* and *Meditationes de prima philosophia*, and the semi-official formulated in the *Principles of Philosophy*, where he agreed to operate with hypotheses.<sup>42</sup> To sum it up, we can say that Descartes' approach is not far from our contemporary theory of science. Most certainly the opposition rationalism-empiricism, with respect to his theory of science, does not seem so radical as

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<sup>41</sup> In the end of the principles of physics he states that God could make it by many ways that natural phenomena would look as they look, and yet it is not impossible to recognise which of those means he wanted to use to make them real. R. Descartes, *Principia philosophiae*, in: *Oeuvres de Descartes*, vol. VIII, part 1, p. 327; cf. p. 327–329. Cf. F. Alquié, *Descartes. L'Homme et l'oeuvre*, p. 132–137; L. J. Beck, *The Method of Descartes*, p. 239–253.

<sup>42</sup> See I. Dąb-ska, *Sur quelques principes méthodologiques dans les Principia Philosophiae de Descartes*. "Revue de Métaphysique et de Morale" 62:1957, fasc. 1, p. 57–66. J. Kopania also refers to J. P. Weber's opinion. Weber would indicate that Descartes allowed for hypotheses in his *Principles*. See J. Kopania, *Funkcje poznawcze Descartes'a teorii idei* [Cognitive Functions of Descartes' Theory of Ideas], p. 373, ft. 243. Cf. J.-P. Weber, *Sur une certaine 'Methodologie officieuse' chez Descartes*, "Revue de Métaphysique et de Morale" 63:1958, fasc. 2–3, p. 246–250. Descartes' natural philosophy had a hypothetical character. Descartes treated his particular theses as only possible, thus at least with respect to natural philosophy he supplemented his intuitionistic and deductionistic rationalism by the empirical and hypothetical approach, see H.-J. Engfer, *Empirismus versus Rationalismus?*, p. 68–74, 89–94; E. Denissoff, *Descartes, premier théoricien de la physique mathématique. Trois essais sur le "Discours de la methode"*, Louvain 1970. Cf. G. Buchdahl, *Metaphysics and the Philosophy of Science. The Classical Origins. Descartes to Kant*, Oxford 1969, p. 118–155; P. A. Schouls, *The Imposition of Method. A Study of Descartes and Locke*, p. 75–87; D. M. Clarke, *Descartes' Philosophy of Science. Studies in Intellectual History*, Manchester 1982, p. 165–194; H. Poser, *Beobachtung und Theorie bei Descartes, Spinoza und Leibniz*, "Studia Leibnitiana" 9:1981, p. 116; cf. *ibidem* p. 115–146; R. M. Blake, *The Role of Existence in Descartes' Theory of Method*, in: R. M. Blake, C. J. Ducasse, E. H. Madden, *Theories of Scientific Method. The Renaissance Thought in the Nineteenth Century*, Seattle 1960, p. 74–103. In most recent Polish technical literature see especially T. Sliwiński, *Ratio et physis. Fizyka teoretyczna Kartezjusza jako realizacja projektu mathesis universalis* [Ratio et physis. Descartes Theoretical Physics as the Implementation of the Mathesis Universalis Project], Nowa Wieś 2005.

we have been accustomed to think on the grounds of manuals for the history of philosophy. It would be extremely difficult to treat Descartes' views as "radical" rationalism that is linked with equally "radical" apriorism and nativism.<sup>43</sup>

#### S U M M A R Y

This paper addresses the issue of categorisation of the theory of science worked out by R. Descartes. Inasmuch as it is justifiable to claim that Descartes is a typical rationalist in epistemology and metaphysics, we may still ask whether it is correct to do the same in his theory of science in relation to modern philosophy of nature, of which he was one of its founders. Descartes intended to work out a universal method which was supposed to be certain, easy, fertile, and complete. In principle, this task is satisfied by intuitive and deductive procedures. In practice, however, he had to consent to a multilevel character of certainty of the theses in his system. This concerns especially philosophy of nature. If he had granted experience the principal role in the starting point of physical analyses, or even it was supposed to be decided about his choice of one a priori and hypothetical explanation, out of many, then at least in comparison with the certainty of metaphysical truths the theses of physics must of necessity remain only hypothetical, excluding only the most general questions. Thus it is also justifiable to think that Descartes had two models of methodology that is, as it were, one official elaborated in the Rules for the Direction of the Mind, Discourse on the Method and in Meditations, and the second one semi-official, formulated in the Principles of Philosophy, where he agreed to use hypotheses. It is therefore difficult to treat his views taken en bloc as a manifestation of radical rationalism connected with equally radical apriorism and nativism, a fact that is further supported by numerous textbooks on the history of philosophy.

#### B I B L I O G R A P H Y

- Alquié F., *Descartes. L'Homme et l'oeuvre*, Paris 1969.  
Beck L. J., *The Method of Descartes. A Study of the Regulae*, Oxford 1952.  
Blake R. M., *The Role of Existence in Descartes' Theory of Method*, in: R. M. Blake, C. J. Ducasse, E. H. Madden, *Theories of Scientific Method. The Renaissance Thought in the Nineteenth Century*, Seattle 1960.

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<sup>43</sup> J. Woleński, *Epistemologia. Poznanie, prawda, wiedza, realizm* [Epistemology. Cognition, Truth, Knowledge, Realism], p. 23–24.

- Descartes' "Radical" Rationalism? On the History of the Theory of Science*
- Buchdahl G., *Metaphysics and the Philosophy of Science. The Classical Origins. Descartes to Kant*, Oxford 1969.
- Chmaj L., *Rozwój filozoficzny Kartezjusza* [Descartes' Philosophical Development], Kraków 1930.
- Clarke D. M., *Descartes' Philosophy of Science. Studies in Intellectual History*, Manchester 1982.
- Crombie A. C., *Augustine to Galileo. The History of Science, A.D. 400–1650*, vol. II, *Science in the Later Middle Ages and Early Modern Times, 13th–17th Centuries*, London 1961.
- Dąbbska I., *Sur quelques principes méthodologiques dans les Principia Philosophiae de Descartes*. "Revue de Métaphysique et de Morale" 62:1957, fsc. 1.
- Denissoff E., *Descartes, premier théoricien de la physique mathématique. Trois essais sur le "Discours de la methode"*, Louvain 1970.
- Descartes R., *Oeuvres de Descartes*, ed. Ch. Adam, P. Tannery, Paris 1897–1913 (repr. 1996).
- Engfer H.-J., *Empirismus versus Rationalismus? Kritik eines philosophiegeschichtlichen Schemas*, Paderborn 1996.
- Garber D., *Descartes Embodied. Reading Cartesian Philosophy through Cartesian Science*, Cambridge 2001.
- Garber D., *Descartes' Metaphysical Physics*, Chicago 1992.
- Garber D., *Descartes' Method and the Role of Experiment*, in: *Descartes*, (ed.) J. Cottingham, Oxford 1998.
- Garber D., *Science and Certainty in Descartes*, in: *Descartes. Critical and Interpretative Essays*, (ed.) M. Hooker, Baltimore 1978.
- Gewirtz A., *Experience and the Non-Mathematical in the Cartesian Method*, "Journal of the History of Ideas" 2:1941.
- Hall A. R., *The Scientific Revolution 1500–1800. The Formation of the Modern Scientific Attitude*, London 1954.
- Hirschberger J., *Geschichte der Philosophie*, vol. 2. *Neuzeit und Gegenwart*, Freiburg 1952, 1991.
- Janeczek S., *Logika czy epistemologia? Historycznofilozoficzne uwarunkowania nowożytnej koncepcji logiki* [Logic or Epistemology? Historical and Philosophical Conditions of the Modern Conception of Logic], Lublin 2003.
- Janeczek S., *Teoria nauki w ujęciu J. le Ronda d'Alemberta. Między empiryzmem, racjonalizmem i intuicjonizmem* [The Theory of Science According to J. le Rond d'Alembert. Between Empiricism, Rationalism and Intuitionism], in: *Philosophia vitam alere. Prace dedykowane Profesorowi Romanowi Darowskiemu SJ* [The Works Dedicated to Professor Roman Darowski SJ], Kraków 2005.
- Janowski Z., *Teodycea kartezjańska* [Cartesian Theodyce], Kraków 1998.
- Kopania J., *Funkcje poznawcze Descartesa teorii idei* [Cognitive Functions of Descartes' Theory of Ideas], Białystok 1988.

- Kuderowicz Z., *Filozofia nowożytnej Europy* [Philosophy of Modern Europe], Warszawa 1989.
- Larmore Ch., *Descartes' Empirical Epistemology*, in: *Descartes. Philosophy, Mathematics and Physics*, (ed.) S. Gaukroger, Sussex 1980.
- Lévy-Bruhl L., *Cartesian Spirit and History*, in: the same, *Philosophy and History*, Oxford 1936.
- Morawiec E., *Przedmiot a metoda w filozofii Kartezjusza* [Object and Method in Descartes' Philosophy], Warszawa 1970.
- Nadler S. M., *Deduction, Confirmation, and the Laws of Nature in Descartes's "Principia Philosophiae"*, "Journal of the History of Philosophy" 28:1990 no. 3.
- Poser H., *Beobachtung und Theorie bei Descartes, Spinoza und Leibniz*, "Studia Leibnitiana" 9:1981.
- Ritter J. (ed.), *Epirismus*, in: *Historische Wörterbuch der Philosophie*, vol. 2, Basel 1972.
- Russell B., *History of Western Philosophy and Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day*, 1946, 1955.
- Schouls P. A., *The Imposition of Method. A Study of Descartes and Locke*, Oxford 1980.
- Śliwiński T., *Ratio et physis. Fizyka teoretyczna Kartezjusza jako realizacja projektu mathesis universalis* [Ratio et physis. Descartes Theoretical Physics as the Implementation of the Mathesis Universalis Project], Nowa Wieś 2005.
- Ueberweg F., *Grundriss der Geschichte der Philosophie*, vol. 3. *Die Neuzeit bis zum Ende des achzehnten Jahrhunderts*, ed. M. Heinze, Berlin 1883.
- Weber J.-P., *Sur une certaine 'Methodologie officieuse' chez Descartes*, "Revue de Métaphysique et de Morale" 63:1958, fsc. 2–3.
- Williams B., *Descartes. The Project of Pure Enquiry*, Middlesex 1978.
- Woleński J., *Epistemologia* [Epistemology], vol. 1. *Zarys historyczny i problemy metateoretyczne* [A Historical Outline and Metatheoretical Problems], Kraków 2000.
- Woleński J., *Epistemologia. Poznanie, prawda, wiedza, realizm* [Epistemology. Knowledge, Truth, Knowing], Warszawa 2005.