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Experimental Induction in Human Sciences and Epistemology of Robert Blanché

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EXPERIMENTAL INDUCTION IN HUMAN SCIENCES AND EPISTEMOLOGY OF ROBERT BLANCHÉ

The following text– with the exception of a short introduction– is an English version of the article I published in *Archives de Philosophie* (*41*, 1978, 659–674) under the title "Les quatres étapes de la science d'après Robert Blanché". The French version of the article was preceded by the following summary in English. Summary: Robert Blanché[1] says that his professors were Brunschvicg, Bréhier and Lalande. In his work of 1949, *Les attitudes idéalistes*, he developed the ideas of Brunschvicg. This work is also a conclusion of the first, philosophical, period of his intellectual activities and a beginning of the second one, purely scientific, devoted to logic and epistemology. This period found its culmination in formulation of the law of four stages which each science passes in the course of its evolution.

The two first sections of the text, "Robert Blanché– Student of Brunschvicg" and "Influence of Lalande and Pedagogical Works by Blanché", are a review of all works by Robert Blanché published during his life. They do not bring, however, their analysis. The third section of the French text has the title "Epistemology– the Science of the Real" and seems to be essential for the whole article. The law of four stages proposed by Robert Blanché, which each fully developed science must pass successively– i.e. descriptive, inductive, deductive and axiomatic stages– receives there a full presentation and analysis. The content of this section gave the title to the whole article in French.

At the end of this article in English I add a fourth section entitled "Experimental Induction in Human Sciences". This is an unpublished text which refers to a single study in the field of these sciences. From the

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* 1904–1984

[1] Robert Blanché, born in 1898, was from 1941 until his retirement in 1969 professor at the University in Toulouse. He died in this city in 1975.

content of this last section we drew the subtitle and the title for this article in English.

I find it useful to present to the English reader the essentials of Robert Blanché's works. He appears one of the best espistemologists of modern times, still little known, also in France, even to specialists in this domain.

ROBERT BLANCHÉ – STUDENT OF BRUNSCHVICG

Robert Blanché wrote in his biographical note that he had been formed by "such prominent scholars as Brunschvicg, Bréhier and Lalande". Although in his works Robert Blanché quotes Emile Bréhier rather rarely, he demonstrates there that by following him he himself became an uncontestable master in the history of philosophy. Further on we will see how to understand the influence of André Lalande. As far as the influence of Leon Brunschvicg's philosophy on Robert Blanché is concerned, it can be said that it was great, powerful and dominating from the very beginning. So, to present Robert Blanché's works, we have to refer first to Brunschvicg and his philosophy, which is an idealist conception but open to arguments of the opposite doctrine, i.e. realism. In Blanché's works there is no systematic and detailed presentation of the ideas of his master. None the less, in his article of 1934[2] a short essay can be found which appears to be a presentation of most essential elements of Brunschvicg's philosophy. Without going into a detailed presentation of that text, let me present its highlights: rational idealism asserts dissociation of the spirit from the reality. It explains objective nature of the reality by the laws which thinking imposes upon phenomena. Thinking, or the intellect, considered as an activity, on the one hand, influences our perceptions and, on the other, tries – on the basis of these perceptions – to build an objective universe. And Robert Blanché writes: "Therefore, we could only let ourselves be carried on by this idealist stream. This is to say we do not claim to be original as far as the principal ideas of our work are concerned." And he adds in the footnotes: "We owe very much to L. Brunschvicg. Having referred only very rarely in the course of our work to this or that fragment of his writings – as we owe him something much more precious than scattered suggestions – we want to point to a decisive influence he exerted upon our thinking." Although these remarks concern only his first work, the thesis of 1934, they seem to apply to all Robert Blanché's subsequent writings.

Conceptions of "rational idealism", of Brunschvicg, of Blanché and similar conceptions of numerous thinkers, theoreticians of cognition and above all those who are today called epistemologists concentrate around two poles or limits, often assuming different names and having more or less differentiated

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[2] R. Blanché, *La notion du fait psychique, essai sur les rapports du physique et du mental*, Paris, Alcan, 1934.

meaning. These meanings, however, oscillate around two basic concepts, always much alike, that can be called respectively *the spiritual* and *the real.* Robert Blanché considered this question very carefully and proposed two systems of these "dualisms". In his thesis of 1934 he distinguished three and in the study of 1949 he discerned more of them, set in four groups.

In his principal thesis bearing the title *La notion du fait psychique*, essai sur les rapports du physique et du mental, published in 1934, he carries out an incisive critique of classical psychology calling upon three dualities which would be ignored by this psychology. These three dualities are: (1) raw experience and organized experience; (2) the thinking subject and the object of thinking; (3) the "I" and the "non-I", a duality focused on the notion of our "own body". First of these distinctions results from the analysis of the word "fact" and refers to the distinction proposed by A. Lalande in his dictionary in the entry "Réel". There are, on the one hand, "crude facts" or "separate images", and, on the other, there exists organized experience becoming an "objective" system, a "system of laws". Blanché writes: By separating and presenting in all its purity each of these meanings... we arrive at an assertion that we never encounter either crude or objective facts but merely facts which we arrange in a series inclining once to the side of crude, once to objective facts... It is exactly within these limits that our cognition moves... These relations should not necessarily be considered *real* but only *true*... They belong to a category that we can call the category of thought or a category of truth" (pp. 29–31). This is then the duality between the isolated image and the universe.

The other duality is that of the thought and the reality. "Thought in no way can be considered as real... If it is not real it is a condition of the objective reality of the universe" (p. 33). It is the opposition between the thinking subject and the object which is thought of.

The third duality is that of the "I" an the "non-I" drawn from the notion of our "own body". "Everyone considers his or her own body as an anonymous object lost in the immensity of the universe and as a centre of the perspective through which to see the order of objects in the universe" (p. 97).

Later, Robert Blanché resumed this subject considering the connection which seemed to unite in the contemporary thought the development of physics and idealist philosophy. He resigned, however, of publication of the work dealing with this subject, giving only in two small volumes of 1948 and 1949 a couple of elements conceived as a part of large study. The first volume, *La science physique et la realité. Réalisme, positivisme, mathématisme*,[3] treated of questions which would be undertaken later in a series of articles he would call "pedagogic".

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[3] R. Blanché, *La science physique et la réalité. Réalisme, positivisme, mathématisme*, Paris, PUF, 1949.

Unlike the first volume, the other *Les attitudes idéalistes*,[4] published in 1949, brings a development of the ideas of 1934 which have just been presented in brief. This short study, comprised in 137 small size pages, is very rich intellectually and it seems absolutely impossible to give here even a very short summary of its contents. One of the major ideas of this study, perhaps even a principal one, is that idealism and realism, if considered as doctrines known and discussed for centuries, are in exclusive opposition to each other. Considered, however, as attitudes they are mutually complementary. "For this reason, says the author, scientific method, such as it has been progressively and, to say so, empirically formed according to the needs of the research, requires rigorously from the scholar that he knows how to assume realist or objectivist and idealist or critical attitudes" (p. 79). But the reflexion that takes as its subject characteristics and evolution of the science– the viewpoint of a "philosopher" or rather of an epistemologist– inclines towards the idealism, what is today accepted in most cases. Although the author soon after the publication of his study was afraid that his work could have been "strangely outdated", it seems that it presents the text always deserving a careful reading and reflection. Such a thorough analysis would be an excellent preparation for the reading of his subsequent works and would also help better understand and evaluate works of other authors touching upon epistemological problems.

INFLUENCE OF LALANDE AND PEDAGOGICAL WORKS BY BLANCHÉ

Robert Blanché's decision to discontinue work on the study of physics, analysed from the point of view of idealist philosophy, closes the first stage of his creative activity. This stage was permeated with the great and beautiful philosophical and epistemological system of Leon Brunschvicg. We could say that in the 1950s, Robert Blanché's thinking, without ever repudiating Brunschvicg's philosophy, underwent a kind of transformation. The second stage is made by a series of 8 works called by their author "pedagogical", written in years 1955–75, and two other, "more personal" ones, of 1966 and 1967, respectively. The pedagogical series deserves the name of "prestigious", to use the term Robert Blanché used when he quoted his masters.

Admittedly, this second stage in Blanché's scientific work was dominated by philosophical works of André Lalande and by the content of his teaching, which, according to an official definition, was called "general philosophy". Beside his study of "evolutionist illusion", André Lalande is known for his philosophical dictionary and studies of pedagogical problems. He is the author of a dissertation on Francis Bacon (Latin thesis) and of a work published in 1929, *Les théories de l'induction et de l'expérimentation*[5]

[4] R. Blanché, *Les attitudes idéalistes*, Paris, PUF, 1949.

[5] A. Lalande, *Les théories de l'induction et de l'expérimentation*, Paris, Boivin, 1929.

which is a record of his lectures given in the Sorbonne in 1921–22, which were no doubt attended by Blanché. In these lectures André Lalande expressed his regret that William Whewell, an English philosopher of the first half of the XIX century, preoccupied especially with the history of sciences and problems of induction and opposing the conceptions of J. S. Mills and his inductive logic, was so little known in France. Consequently, Robert Blanché presents as a complementary thesis a detailed study of Whewell (218 pages, in 8°, published in 1935)[6] and translates into French and publishes in 1938 most important chapters from the best known work by Whewell, *Novum Organum Renovatum*.[7] The latter work was devoted to the restoration of Bacon's conceptions on induction. The topic of the series of pedagogical works by Blanché is logic and epistemology, that is the subject restored and brought up to date by teachings of André Lalande.

The first work of this pedagogical series published in 1955 is the only one in this series preceded by an epigraph which I find interesting enough to quote here: "O mathematiques sévères, je ne vous ai pas oubliées, depuis que vos savantes leçons, plus douces que le miel, filtrèrent dans mon coeur, comme une onde rafraichissante... il y avait du vague dans mon esprit, je ne sais quoi épais comme de la fumée; mais je sus franchir religieusement les degrés qui mènent à votre autel, et vous avez chassé ce voile obscur, comme le vent chasse le damier. Vous avez mis, à la place, une froideur excessive, une prudence consommée et une logique implacable." Lautréamont, *Les chants de Maldoror*.

Obviously, the "mathematiques" in this text symbolize what is precise, determined, as compared to what is vague or little determined. How should we understand the application of this text? For what reason did Robert Blanché choose it? Three answers can be given here. But knowing Robert Blanché only from his publications it would be difficult to assume that any of them would be more exact than another.

To begin with, one can suppose that this text refers to the author himself who in the first stage of his activity was still preoccupied with philosophy but since then approaches the subject from another point of view, the subject conceived as having already been detached from philosophy and having become science where no vagueness can be tolerated: the answer made in a neo-positivist style. Even if this answer is not precise it characterizes the direction of the transformation. Secondly, this text could apply to the whole series of pedagogical works initiated in 1955. And, finally, the third answer, this text may concern only the concrete subject dealt with in the work at the head of

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[6] R. Blanché, *Le rationalisme de Whewell*, Paris, Alcan, 1935.

[7] Whewell, "La construction de la science" (*Novum Organum Renovatum*, livre II). The text translated and presented by R. Blanché, Paris, Vrin, 1938.

which it is published and whose title is *L'axiomatique*,[8] which has already been mentioned; further reference to it will be made later. It is a 110-page-long, small size brochure now in its sixth edition. The subject is not vague. Thus, an axiomatic procedure is a normal effect of any already fully deductive intellectual process; the procedure today is successfully applied only in logic and in mathematics (the latter making one body with the logic) and in physics, those most developed and precise among existing sciences.

Two years later, in 1957 there appeared *Introduction à la logique contemporaine*.[9] The title characterizes this work well; we find there both an introduction to modern logic and a presentation of several topics discussed by contemporary logicians. The two first publications in the series are complementary in the sense that problems of deduction are discussed more comprehensivelly here than in the first of the two works.

After ten years – the time gap resulting among other things from the fact that Robert Blanché had to organize and direct courses in esthetics established at that time in Toulouse – he published from 1967, with a remarkable regularity of two and eventually one year intervals (i.e. two works every three years) works of the pedagogical series. These are six publications which, arranged in three groups, two papers in each, make a whole conncted either with a common subject or common perspective.

A group of two studies published in 1967 and 1969 discusses topics dealing with problems of the development of physics. The work published in 1967 has the title *La science actuelle et le rationalisme*,[10] and it is of the same size as the other publications in this series. Having indicated the way modern physics had to adjust to the experience and how it was brought to using new concepts (four-dimensional continuum, quanta, etc.), Robert Blanché observes in the conclusion, analysing conceptions of many authors who touched upon this problem, that determination of the new concepts of rationality, still being in process of elaboration, does not go along empirical line.

The other study of this group, *La méthode expérimentale et la philosophie de la physique*,[11] is an important selection of texts of various authors, from Bacon to the modern times. The whole work is divided into books and chapters, with each book being preceded by a thorough analysis and each chapter provided with a detailed commentary. Although it is but a selection of texts, the whole work constitutes a study of history of concepts which made the sience of physics progress, as well as those which were only a reflection of this progress. In his study Robert Blanché touches upon the

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[8] R. Blanché, *L'axiomatique*, Paris, PUF, 1955.

[9] R. Blanché, *Introduction à la logique contemporaine*, Paris, Armand Colin, 1957.

[10] R. Blanché, *La science actuelle et le rationalisme*, Paris, PUF, 1967.

[11] R. Blanché, *La méthode expérimentale et la philosophie de la physique*. Texts selected and presented by R. Blanché, Paris, Armand Colin, 1969.

same subject as André Lalande in his lectures of 1921–22. Both studies end with an analysis of purely philosophical conceptions concerning fundamentals of the induction and experimental reasoning. After a period of almost 50 years Blanché's work appears as a continuation and deepening, on the basis of most recent works in this field, of the lectures by Lalande of 1921–22.

Two studies of the next group, published in 1970 and 1972 concern two subjects to which Blanché decided to limit his works in the second period of his activity; these were logic and epistomology. The study of 1970 has the title *La logique et son histoire d'Aristote à Rousseau.*[12] We will limit ourselves to a short mention of this work, very important for the logic and most comprehensive of all in the pedagogical series (366 pages, in 8°).

The other study of this group, „L'épistémologie", was published in 1972 in the series *Que sais-je*?[13] This small volume is most important, practically central to all Blanché's works. In a very concise form he comprised much content in it, and opinions of a great many specialists and philosophers are related there ith precision, while the way of presentation is both careful and intelligent. Among others, in the elements concerning epistomology in his whole work he does justice to works by two prominent specialists in these matters, Gaston Bachelard and Rudolf Carnap. He adapts, when he finds it useful, their conceptions and then integrates their ideas or some of their ideas within much wider horizons of the system worked out by Leon Brunschvicg, the system that Blanché made his own. By doing this he showed intellectual affinity with studies like *Les attitudes idéalistes*, which have been briefly presented earlier, emphasizing their importance. It will be necessary to come back to this problem later.

The last two studies of the pedagogical series published in 1973 and 1975 discuss the matters of reasoning. It is always recommendable to place the notion under analysis against a large background. In this case this background is not drawn by philosophical conceptions of Leon Brunschvicg with which Robert Blanché's mind was permeated from his youth. According to these conceptions, the point of departure is intellectual activity taking awareness from its own work. Intelligence is the mind in action. The activity of the mind is studied by observing the way it externalizes. A result of this activity of the intelect, succession of sciences becomes this externalization. Intellect is the faculty of creating judgements and reasoning. The subject of the two last books by Robert Blanché is the analysis of various types of reasoning. The first one, published in 1973, bears a simple title, *Le raisonnement.*[14] After a general analysis (Chapters I–VIII) the author, laying no claim to be complete, makes a review– "by means of a kind of empirical enumeration"– of eight types of reasoning.

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[12] R. Blanché, *La logique et son histoire d'Aristote à Rousseau*, Paris, Armand Colin, 1970.
[13] R. Blanché, "L'épistémologie", Paris, series *Que sais-je*? No 1475, Paris, PUF, 1972.
[14] R. Blanché, *Le raisonnement*, Paris, PUF, 1973.

He begins with deduction and goes through induction and analogy, to end with argumentation and fallacious reasoning.

The second study, the last work by Robert Blanché, appeared in the spring of 1975, a couple of months before his death on December 6th, 1975. Its title is: *L'induction scientifique et les lois naturelles.*[15] This work, very rich in content, besides the main topic discusses another, relatively distinct matter. In accordance with the title, it is induction, that is development of a specific point of the earlier study. However, unlike the earlier work, this one emphasizes historical aspects of induction. The core of the work constitutes six chapters, each examining one type of induction. The analysis is preceded by two chapters making it easier to distinguish among those six historical types. In the chapter „Evolution of the Scientific Ideal" the author discerns three forms of this ideal (on this point Robert Blanché said he followed the conceptions of André Lalande and Gaston Bachelard): (1) Science of the matter, so attributive thinking, interlocking the classes; (2) science of successive events, so search for causes; (3) science of quantitative relations, so the use of mathematics as an explanatory principle. None the less, adds Robert Blanché, given the non-synchronic evolution of various sciences, in modern biology and in today's human sciences search for causes still takes a dominating position. The next chapter has the title "Scholar's Bipolar Deontology"; it is then a come back to one of the "dualities" a great number of which were finely analysed in the study of 1949, *Les attitudes idéalistes*. The problem here is the opposition between points of view of phenomenalism and rationalism, which corresponds to the opposition between realist and idealist attitudes analysed in 1949. In view of their content, these two articles could be directly tied with *L'épistémologie* to make its most essential part. Beside these two purely epistemological chapters, in the work of 1975 there are two other chapters, the first and the last, which concern induction – the main topic of this study. The last chapter, "Induction of Laws and Elaboration of Theories", although it deals specifically with physics, seems to have a more general meaning. For this reason it is particularly instructive to those who in the sphere of human sciences, passionately preoccupied with deduction consider it the only worthy scientific procedure, with induction in their opinion being outdated. At the between points of view of phenomenalism and rationalism, which corresponds transition between Newton's and Einstein's systems. We cannot pass from the first to the second by accumulating knowledge, by intensifying our care of measures, by easily rectifying principles. Conversely, we should seek a total novelty. Therefore, while passing from classical to relativist thinking, we follow transcendent and not amplifying induction."[16] In the same way as

[15] R. Blanché, *L'induction scientifique et les lois naturelles*, Paris, PUF, 1975.

[16] Amplifying induction is transcendent induction? A difference of the nature or of a degree, as we think? It is not possible, however, to undertake here an analysis of the fine, extremely rich and profound thought of Gaston Bachelard.

physical theories induce laws, physical laws are arrived at through induction– as it appears in the history of physics in the 17th and 18th centuries– and these results were received with the aid of such an induction which is not a logically rigorous process. In the present paper some consideration should also be given to the first chapter which in spite of its title, "Terminological Questions"– which might suggest relatively unimportant matters– brings masterful and concise explanation of essential questions of induction. This makes Robert Blanché a great expert of problems of induction which appears to play a major role among other logical procedures.

The first chapter of the study of 1975 concerning induction is one of the three great texts remarkably concise and particularly important in the series of eight pedagogical writings. The two other texts are *L'axiomatique*, of 1955, which concerns deduction, and *L'épistémologie*, of 1972, an analysis of science in the most general sense.

Taken together, the series of eight pedagogical works appears as one great essentially epistemological treatise, although logical subjects take there an important place.

There are two ways to assess the work of a philosopher, a scholar. It can be appreciated because it brings new ideas, forming a line of progress in comparison with other works. Conversely, it can be evaluated for just the opposite reasons: that the author, the philosopher, does not distinguish from others but, instead, brings out, clarifies and synthesizes the ideas common to his epoch but not perceived and formulated clearly anough by others. It seems that works of Robert Blanché have great value just for the latter reason. Lucien Lévy-Brühl in his study of 1900 on the philosophy of August Comte observes that positive thinking, as formulated by Comte, "has so perfectly merged with general thinking of our times that it remains almost unnoticeable, as an air we breath with". It seems to me that the thoughts expressed in the eight works of Robert Blanché are in their essence generally accepted today. This great merit is to have formulated and clarified them in such masterful way.

It would be also appropriate to appreciate these works for the first of reasons which have been mentioned, by observing that there are also new ideas, new findings there. In logic we have to mention first two works Robert Blanché considered as "more personal" than his pedagogical studies: *Structures intellectuelles*[17] and *Raison et discours*[18] which appeared in 1966 and 1967, respectively, and which have not been analysed here.[19] Without claiming to be complete, let us mention three of his discoveries. The

[17] R. Blanché, *Structures intellectuelles*, Paris, Vrin, 1966.

[18] R. Blanché, *Raison et discours*, Paris, Vrin, 1967.

[19] They were reviewed, among others, by G. Kalinowski; see: *Les Études Philosophiques*, 1966, pp. 541–542 and *Archives de Philosophie*, 34 (1971) pp. 157–160. Having pointed to the two last studies, we reviewed all works which Robert Blanché quotes in biographical note at the beginning of this article.

construction of hexagonal logic is of great ingenuity and elegance. As P. M. Schuhl observed, it is a novelty which for the first time for many centuries brings an improvement to Aristotle's classical logic.[20] It is highly appreciated by logicians.[21] We can also mention a new interpretation of the master-argument by Diodor of Cronos[22] as well as discovering in Leibnitz's writings of an outline of the logic of norms.[23]

From our point of view, however much more important is Robert Blanché's personal contribution to epistemology, the sphere that always attracted him, which was evidenced especially in his thesis of 1934 and in *Les attitudes idéalistes* of 1949. It is just to better analyse and better understand this contribution that we cut the way across his works. Now, time has come for a frontal approach.

EPISTEMOLOGY – THE SCIENCE OF THE REAL

In order to present the contribution of Robert Blanché to epistemology, we have to, relying upon the whole of his writings, illustrate his understanding of this discipline. This is the science that tries to study the sciences, their characteristics and development. It synthesizes and replaces methodology considered formerly as separate from logic and theory of knowledge conceived as a part of philosophy. To this also an essential, historical aspect is added. A coherent system of principles is shaped up to present funamental principles of the science. This examination is most often based on the study of the existing stage of development of the science, primarily on most developed sciences, such as physics.

From this point of view, the conceptual system we arrive at in this way seems to have certain characteristics of formal sciences, like mathematics and logic taken together. However, in the heart of the matter it is not so because when we deal with any science, be it even mathematics, we always encounter the real built through the ages by the human mind. The conceptual system in question is often erroneously identified with the whole of epistemology. In reality only a part of it can be called "formal epistemology".

It turns out that so defined epistemology becomes a tool, indispensable to tackle another aspect of the study of sciences, essential and fundamental, which can be called "epistemology – the science of reality". It has been worked out according to the same scheme as any other natural science, e.g. physics or biology, and it includes formal epistemology as one of its

[20] P. M. Schuhl, Revue Philosophique, 1975, p. 507.

[21] G. Kalinowski, *Études de logique déontiques*, I (1953–1969) L.G.D.J. 1972, VII. "L'axiomatisation et la formalisation de la théorie hexagonale de l'opposition de M. R. Blanché (Système B)", pp. 161–167.

[22] G. Kalinowski, "La logique et son histoire", *Archives de Philosophie*, 36 (1973) pp. 125–126.

[23] G. Kalinowski, *La logique des normes*, Paris, PUF, 1972, p. 207.

components. A physicist uses mathematics as one of his tools, but this tool still is not physics itself.

Similarly, formal epistemology, being a tool of epistemology in its strict sense, does not identify itself with the latter, whose unique objective, as that of physics, is to discover regularities existing in its field of interest. So understood, epistemology focuses on tracing the course of successive stages of development of various sciences, and tries to discover possible regularities of this historical course. It turns out, then, that such epistemology, first separated from philosophy, becomes science. Separated also from logic, a formal science, such epistemology confirms itself as being a science of the reality, for the same reason as are physics and biology. What is more, among the sciences of the reality there are sciences of man and epistemology shows itself to be one of them because the reality it analyses– historical development of the sciences– is a human reality. Our analysis of what, according to Robert Blanché, would be epistemology does not rely solely either on his own terminology or way of thinking. In his writings we cannot find the terms like "formal epistemology" and "epistemology– science of the reality". We feel, however, we have remained faithful to his conceptions, sometimes difficult to grasp at first approach because of his style full of shades of meaning and qualifications.

In the light what has just been said, the ideas concerning epistemology, present in eight pedagogical works of Blanché, all belong to the sphere we have called "formal epistemology", a tool of "epistemology– science of the reality".

To explain this, we have to address first to three phrases we find in *L'axiomatique*, § 25. Robert Blanché writes there:

"There is a certain law of development of sciences that makes them pass, in a fixed order, set by the place each one of them occupies in the hierarchy, through four successive stages: descriptive, inductive, deductive and axiomatic. Axiomatics remains rather void, unless it is built on an earlier deductive theory which, in turn, has no scientific value unless it sets up a comprehensive body of laws worked out inductively, following a long exploration of the phenomena. Physics, relying upon induction in the XVII and XVIII centuries, having opened in the XIX century the epoch of great deductive theories, has arrived today at the point where axiomatic approach becomes rather largely applicable in it".

The importance of this conception, dealing with the historical aspect of epistemology, did not pass unnoticed. M. S. Kamiński in his learned work quotes, among other authors, also Robert Blanché. But in the works by Blanché, Kamiński notices only the conception of four stages every science has to go through, which makes him assume that this constitutes the essence of the whole Blanché's work. Independently of this opinion, the idea of "four stages" deserves a close inspection. The second part of the above quotation tells jointly about four successive stages and their reciprocal

interconnections, with the next stage being impossible without appropriate development of the preceding one. We find there also individual characteristics of each stage with a remark that their individual development is a result of long and persistent efforts. The third stage helps us understand that it is not only the matter of individual effort but a shared work of generations, extending to many centuries. All this is presented as the law of historical evolution. Was Robert Blanché aware of the weight and importance of his affirmation presented as the law of evolution valid for the whole of science? These three phrases may have also been put into his text as auxiliary statements to show certain characteristics of the axiomatic procedure he analysed. There is no doubt, however, that Robert Blanché was aware both of the importance of the law he formulated and of the fact that the three phrases could be a conclusion crowning an important, long and painstaking research into the history of sciences. He was also aware that these çonclusions resulting in an affirmation of the existence of a law would be an outcome of an inductive process, a reasoning logically uncertain (second, inductive stage of evolution of every science), and that this induction would be conditioned by prior knowledge of particular facts gathered from a continued observation of these facts (first, descriptive stage of every science).

It turns out, then, that Blanché does not make clear all aspects of his work. It is, therefore, right to try to determine on the basis of his writings a certain conception he did not formulate but only implied. To do this, we have to make several remarks.

Robert Blanché formulating the law of four stages based his views only on physics. He did not mention any other science the observation of which could have permitted him to come to his formulation. It is, however, evident since we know his other works that this law is drawn also from history of logic (let us note he published a weighty history of this science) and from history of mathematics (he knew it perfectly what is evidenced in his development of conceptions of Brunschvicg, one of the specialists on the history of mathematics).

It would be therefore interesting to see whether this law can be positively verified in its whole logic, in mathematics and in physics.

And if we suppose verification of this law is not possible, as it is generally claimed by Karl Popper, would it be so that the law is "falsified". The law in question is confirmed as valid for all sciences. So, this can be extended also to history of biology– the field of interest of M. Canguilhem– and that of social sciences. It is clear, given the considerations we have just presented, that we do not treat any more these questions as an inquiry into whether epistemology conceived as a science of reality could be established and by what means; just the opposite, we clearly see that we are facing essential problems of epistemology, science of the reality,

as having already been established. Therefore, if all procedures aiming at verification have not yet proceeded effectively nothing prevents us, theoretically or materially, to start them today. What is more, it turns out that Robert Blanché to be able to establish the law of four stages got involved into the procedures of this kind.

Consequently, epistemology, science of the reality, does not need to be created but continued. It is noteworthy that Robert Blanché did not point in his writings to have effectively carried out this sort of research, and that the law of four stages valid for all sciences was a result of it. He certainly thought that as a philosopher he was not in a position to carry on a research concerning the reality and pursue it with the aim of detecting the laws governing that reality. He adopted that attitude, although he was one of the best fitted to pursue systematically and fruitfully that sort of investigations. For the same reasons, when he formulated the law of four stages he did not present it as his own discovery.

We are now able to determine what is new in the work of Robert Blanché, the epistemologist. Summing up what he said this novelty consists in conjunction of the following circumstances: (1) we have now, in part thanks to the contribution of Robert Blanché, epistemology established as a science of the reality; (2) this reality is a thousand-year-old development of all sciences; (3) this reality is the one that concerns human facts and because of this epistemology– science of the reality– is a science of man; (4) epistemology, having already passed the descriptive stage, has entered inductive stage; (5) inductive procedure brought the formulation of the law of four stages for every science; (6) on the basis of this law we can carry on multi-directional research set to balance, correct, limit– i.e. to undermine the law in question– given, obviously, only its provisional form.[24]

In general, Robert Blanché not only managed to synthesize the elemens, sometimes not fitting to each other, of what could be called formal epistemology, and this can be recognized as very important. And, as it results from the above, he contributed in a decisive way to the creation of epistemology– a social science the structure of which is defined in the above 6 points. Epistemology is thus understood according to conventional schemes of all other natural sciences, and can be proud of being recognized. Its objective is to develop further along the same lines.

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[24] It is impossible in the course of this article to develop the questions implied by point 6. We should, however make some remarks concerning this subject. First, descriptive stage of every science was preceded by a pre-scientific stage– for mathematics and physics that stage was described by Leon Brunschvicg. This circumstance is much helpful in the analysis of the recent history of social sciences. Secondly, the notion of four-stage evolution of each science does not mean that this process occurs regularly and without obstacles. Although Robert Blanché did not say that explicitly, the idea that this progress can stop, i.e. recess, does not seem to contradict his conceptions.

EXPERIMENTAL INDUCTION IN HUMAN SCIENCES

The fourth and last section of this article is essential to the whole presentation. It concerns the connections existing between the theory, as represented by the epistemology of Robert Blanché, and the practice, in this case the statistical study of the population of big cities.

Our study of 1952 "Population of Great Urban Agglomerations of London and Paris in the 19th and 20th Centuries"[25] (*Population*, 1952, no. 3) can be considered as such a study in experimental epistemology. This was conceived from the beginning as an attempt to verify the effectiveness of a classical method used in natural sciences. It is, namely, a strictly inductive method applied to a certain aspect of human reality. The principal goal of the research was to investigate the effectiveness of the method— the problem essentially epistemological. Because such experiment was workable only on the basis of a concrete human reality the choice of the object of study— urban population— was of secondary importance.

In the case of induction, exactly the same procedure was adopted by François Simiand in his work of 1932 concerning wages of French workers.

According to Blanché's conceptions, induction is only an unavoidable stage each science passes in its evolution from the descriptive to the deductive stage. We touched upon the system conceived by Robert Blanché because he considered the problem of induction in a clearly wider epistemological context than did François Simiand or Maurice Halbwachs in their methodological conceptions. It is to be also emphasized that François Simiand and Maurice Halbwachs were always inclined to apply methods of natural sciences to the disciplines called the humanities. Both of these scholars had good backgrounds of general philosophy but as far as epistemology is concerned they remained far behind Robert Blanché. The latter is younger by one generation and interested, among other things, in the modern discipline of epistemology.

At first sight it seems that the present evolution of human sciences runs according to the laws formulated by Robert Blanché, provided, obviously, that these sciences intend to follow rigorously the method tested for centuries by natural sciences. It is, however, rather frequent that these human sciences do not try at all to follow the method of natural sciences. In such cases Blanché's epistemology cannot be taken under consideration. This epistemological experimentation brought positive results. It permitted to note that strictly inductive procedure, that is one taking no hypothesis at the beginning of the study, was successfully applied to the study of

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[25] S. Korzybski, "Le peuplement des grandes agglomérations urbaines. Londres et Paris aux XIX et XX^{e} siècles", *Population*, 7(3), 485–520, 1952.

urban reality carried out with the aid of the data from population census and others, namely economic ones. This urban study permitted to discover in urban reality certain unknown regularities, regularities that were formerly impossible to suspect and *a priori* difficult to imagine.[26]

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[26] S. Korzybski. "Une méthode Inductive et Peuplement Urbain". Thèse. Université de Paris V, Sorbonne, 1975, I. *Étude* 1–270, II *Étude* 485–520, III. *Étude* 113–156, IV. *Étude* 600–814.