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Benedetto Croce's Theory of Science

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ABSTRACT. Benedetto Croce theorizes that natural sciences are defective sciences, because they always bump against facts that require to be intuitively and historically understood, and because they set up concepts which are anything but natural. These concepts can be used only in order to organize the empirical material; therefore they are mere schemes, or pseudo-concepts, or conceptual fictions. These fictions are of great help in simplifying the physical reality and in stating relations within it; they have an instrumental character like a sort of necessary functions and practical acts. Their main feature is the lack of universality; therefore they are just the opposite of pure concepts. Such logical theory does not involve a depreciation of natural sciences, which are rather viewed as a form of practical, economical knowing, like in the perspective of empiriocriticism (Avenarius, Mach) and conventionalism (Poincaré, Le Roy, Milhaud). But, unlike all these philosophers, Croce distinguishes clearly between pure sensation and intuition, on the one hand, and pure concept, on the other hand. And he founds real knowledge only on pure concepts.

1. Introduction

1909 Croce published a work named *Logic as the science of the pure concept*. This work has been charged since its appearance of having criticized science and reducing it as a false form of knowledge, namely as a knowledge based upon "pseudo-concepts". The main authors of this critic were theorists

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like Federico Enriques and, after the Second World War, Ludovico Geymonat and his pupils, above all Giulio Giorello. A such seeming depreciation of science, combined with the cultural hegemony detained in Italy by Croce (and in general by the idealistic thought) had produced – as sustained by the Geymonat's school – a delayed circulation of modern scientific culture in Italy, in comparison with the rest of Europe and the world.

My aim is to defend Croce on this point and thus demonstrate that – when we rightly judge them – Croce's views on natural science, considered as a specific form of knowledge, are analogous to the epistemological theories which circulated at the beginning of the 20th Century within the fields of empiriocriticism and conventionalism.

In the first part of this paper I will focus on Croce's theory of science itself, while in the second part I will deepen the context in which his theory developed, to clarify in which sense Croce's theory of science can be seen as analogous to those circulating in Europe between the end of the Eighteenth century and the beginning of the Nineteenth.

2. The Theory

Can we relate Croce's thought with epistemology, or theory of science at all? Croce is not an epistemologist, nor did he dedicate a lot of pages to the philosophy of science. He's not a scientist, but not being a scientist should not be a sin, also by formulating a theory of science. The problem is: In which sense does Croce formulate a theory of science? At the beginning of the Nineteenth century Croce is a convinced enemy of positivism, i.e. enemy of a philosophy featuring the doctrine of a 'general philosophy' which is above all particular sciences, namely the sciences of nature (physics, chemistry, biology, psychology). Within this so-called 'late positivism', which assumed the tacit 'scientific' presupposition that the only reality is the material one, philosophy is conceived (i.e. in the first part, named "The Unknowable" of the *First Principles* [1862] of Herbert Spencer) as having the task to show how all science leads ultimately (like religion) to a belief in an Absolute that transcends human understanding. This attitude – widely spread also in Italy at that time, above all among socialist circles, with whom Croce had sympathized in past years – leads, in Croce's opinion, to a way of thinking featuring a 'metaphysical' attitude enemy of criticism.

The theoretical, i.e. the *logical* error of this doctrine is the presupposition that the only knowable reality is the material one. On the contrary, already in his first main philosophical work, i.e. the *Aesthetic* (1902), Croce writes that the only true science is the science of the spirit, and that the natural sciences are defective sciences, always bumping into facts which are intuitively and historically understood, and setting up concepts (unextended atom, ether or vibrating, vital force, unintuitable space) which are anything but natural.

In 1904-5, in the first edition of his *Logic*, Croce repeats that natural disciplines cannot count as type or model of the true, solid and only science. In fact – he writes – the gnoseological theories they lately posed insist on the conventional character, handy, practical, economical of the constructions on which natural sciences work. These constructions are irrational as knowledge, but quite rational as practical facts (of the spirit).

In the second edition of his *Logic* (1909) Croce articulates knowledge in two degrees. Knowledge is first knowledge of the individual, intuition that is also representation, and that is object of the aesthetic as a science. On a secondary step, knowledge is knowledge of the universal. Involved in this knowledge is not intuition, but thought, that is concept, pure concept, concrete universal:

> Logical knowledge is something beyond simple representation. The latter is individuality and multiplicity; the former the *universality* of individuality, the *unity* of multiplicity; the one is intuition, the other *concept* (Croce [1909], engl. transl., 8).

The *Logic* is divided in two main sections. The first is dedicated to the definition of "the pure concept, the individual judgment and the logical synthesis *a priori*". The second is devoted to "philosophy, history, and natural and mathematical sciences". Croce aims to distinguish between *pure concept***,** on the one hand, and *empirical and abstract concepts*, on the other: the first is the fundament of logic, the second ones are used by natural sciences to ordinate the empirical material and are simply *schemes*. Only the pure concept is real in itself. Empirical concepts, like abstract concepts, are pseudo-concepts, conceptual *fictions*, used by the sciences to simplify the physical reality in order to state relations in it, by quantifying reality stating "natural laws", i.e. relations between natural facts. Material to knowledge is given by intuition. The beginning of knowledge is not perception: it is intuition, and *sensations are consequences, not causes, of the intuition*. They come after it, not before it.

But what are these fictions, on which the knowledge of both natural and mathematical sciences is based? On the first hand, fictions are "spiritual products, which aid and contribute to the life of the spirit". They are "necessary functions". They are "practical acts". They make easily available to memory a patrimony of acquired knowledge that once has been possessed. Conceptual fictions are instruments constructed for this purpose. By means of them armies of representations are evoked with a single word, or a single word approximately indicates what form of operation must be resorted to, in order that certain representations may be recovered (Croce [1909], engl. transl., 20-21).

Croce distinguishes, then, between "science" in the proper form, that is "logic" or "philosophy", and "natural science". The first is based upon "concepts", pure concepts, the second is based upon "empirical concepts", on the one hand, and "abstract concepts", on the other. Both of them are "fictions". So, while a true and proper concept is universal in itself, ultrarepresentative and omnirepresentative at the same time, the main feature of fictions is precisely the lacking of this universality:

> [In] fictional concept or conceptual fictions either the content is furnished by a group of representations, even by a single representation, so that they are not ultrarepresentative [that is the case of "empirical concepts"]; or there is no representable content, so that they are not omnirepresentative [that is the case of "abstract concepts"]. Examples of the first type are afforded by the concepts of *house*, *cat*, *rose*; of the second, those of *triangle*, or of *free motion*.

Once stated that the theory of conceptual fictions, namely pseudo-concepts, means by Croce not a depreciation of science as a form of knowledge, but only a theorization of it in the sense of a practical knowledge, or better of a practical act of knowledge, my final aim is to prove that this economical theory of science is not – like someone once said – an aping or mimicry of the similar theories of empiriocriticists and conventionalists, but has its own theoretical axis inside the philosophy, or simply the logic, of his author. To state that, we have to assume a "genetical" perspective[1] in considering the logical thought

[1] Recently Michael Friedman has defined the conception of scientific knowledge by which the Marburg School – "adapting critical philosophy to the deep revolutionary changes affecting mathematics and the mathematical sciences» throughout the late nineteenth and early

of Croce. That means, we have to investigate historically his theory, to find out which philosophical roots his theory of logical concept has.

3. The Context

Croce attributes much importance to the logical thought of Kant. Elaborating a cue from Leibniz's *New Essays on Human Understanding*, printed in 1765, Kant began to rebuilt the Logic as a philosophical science. Against all empiricism – an empiricism that, by Hume, ended in skepticism – Kant strived to demonstrate that the exact science of nature is possible. The *Critique of Pure Reason* contains the Logic of physical and mathematical sciences, thought not more by an empiricist but by a philosopher, who overtook empiricism and recognized that the concepts of experience presuppose an human intellect that originally constructs them.

But Kant confused the logical and philosophical *a priori* synthesis – his major discovery – with the *a priori* synthesis of the sciences, i.e. mathematics and physics, thus invalidating his profoundly romantic concept of the synthesis *a priori* through a "classicist and intellectualist" treatment of it:

> The synthesis is the palpitating reality which makes itself and knows itself in the making: the Kantian philosophy makes it rigid again in the concepts of the sciences; and it is a philosophy in which the sense of life, of imagination, of individuality, of history, is almost as completely absent as in the great systems of the Cartesian period (Croce [1909], engl. transl., 535-7).

It was Hegel who established the new doctrine of the concept. The true concept for him is the *idea*, and the idea is the absolute unity of the concept and of its objectivity. It was Kuno Fischer who clearly distinguished the empirical concepts from the pure ones, and noted that those which are pure or philosophical are, in the spirit, the basis and presupposition of the others. The pure concepts do not represent phenomena, but connections and relations.

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twentieth centuries – replaced Kant's original 'static' or timeless version of the synthetic a priori, as an essentially developmental or 'genetic' one (Friedman [2010], 178).

In the last pages of the historical section of his *Logic*, Croce refers explicitly to the new theories emerging from the field of mathematics, physics and natural science themselves, theories that recognizes the "practical" or "economic" character of these sciences. Croce holds, for example, the empiriocriticism of Avenarius (1890) in high esteem, while considering science to be a simple description of the forms of experience (pure intuition or pure perception) for the purpose of simplifying it. Mach (1886) is considered the one who has developed and popularized these views, by reaching them as own conclusions departing from the study of mechanics[2]. Within the Neo-Kantian field, Ernst Rickert, in his book on the *Limits of concept formation in natural science* (1896-1902), also, outgoing from other cultural assumptions, holds the concept resulting of the labour of the sciences to be nothing but a means to a scientific end.

What about France? Here the same ideas are sustained by a group of thinkers variously called philosophers of contingency, of liberty, of intuition or of action. For Bergson the concepts of the natural sciences are *symboles et etiquettes*. Le Roy holds that scientific laws only become rigorous when they are changed into conventions. Moving from the theories of higher geometry, which revealed the practical character of mathematics, Poincaré and Milhaud affirms the conventional character of the mathematical and physical sciences (for more details see Brenner [2003]). But the limit of all these theories, Croce argues, is to put pure sensation and intuition – instead of pure concept – "as the term that is distinct from the empirical and abstract concepts, as the knowledge that is not falsified by practical ends and discovered beneath labels and formulae" (Croce [1909], engl. transl., 557-8).

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[2] Very interesting similarities to Croce's views are to be found in Husserl (1900), 192-210.

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