

# Continental Contributions to Philosophy of Science\*

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**ABSTRACT:** The author reviews the book *Continental Philosophy of Science*, edited by Gary Gutting. Introductory remarks about the historical relationship between philosophy and science are followed by a presentation and discussion of different philosophies of science and commentaries on the eleven German and French authors whose texts are found in this volume. In addition to her assessment of Gutting's collection, the author's overall conclusion is that one characteristic trait of the Continental philosophy of science is its attempt to elaborate a more complete picture of the world, one that takes lived experience into consideration and examines questions excluded by the methodology and concepts of science.

**KEYWORDS:** Continental philosophy, history of science, philosophy of science.

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## Historical Introduction

Before discussing the different perspectives on philosophy of science presented in this book, I shall make a brief survey of the history of science. As early as antiquity, philosophers were strongly interested in explaining the physical world. While Plato looked for timeless structures of the universe which could be described mathematically, Aristotle dealt especially with biology. Nevertheless, the method they used was not yet that of modern science. Four or five different forms of causation were taken into account: *causa efficiens*, *causa materialis*, *causa finalis* and *causa formalis*, as well as eternal ideas. Therefore, even matter could not be conceived without formal, immaterial aspects. Moreover, the most important question was not how and under which conditions something came into being, but what

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the very essence of an entity was. Determined by its essence, every entity had an intrinsic value grounded in absolute being. Therefore, in contrast to modern science, the concept of being could not be separated from values. The philosophies of nature and science formed an inseparable unity.

Only in the 15<sup>th</sup> century did the method of observation change fundamentally. The birth of modern science consequently led to a new concept of being, and changed the way humans related to each other and the world. In his treatise *The Layman on Experiments Done with Weight Scales*, Nicolaus Cusanus explicitly develops the “program of an experimental science” for the first time. With Galileo Galilei, this becomes the method of modern science and, for certain philosophical traditions, even the basis of the concept of truth. For humanitarian reasons, namely, in areas such as medical treatment, agriculture and justice, Cusanus postulates that all properties of objects which could be measured, should be. Different observers can agree only if observations are independent of their own sensations and feelings; in this respect, modern science has not changed its methodological premises. To achieve this aim, a special method must be applied: the qualities of things are to be measured through a long series of systematically constructed experiments that permit the reproduction of identical conditions. The instrument of observation is, therefore, not simply an extension of daily experience. Although it undoubtedly broadens the horizon of observation, it also transforms the concept of experience in a distinctive manner. Qualities hidden to our ears and eyes can be made visible; yet in the process they are quantified. Objectivity in the scientific sense of the word can be achieved only if a theory is based on data independent of all reference to human beings, to a first- and second-person perspective. In order for a measurement to be reproduced at any place and time and by any person, all qualified sensations must be excluded, as well as bodily expressions of intention or meaning, emotions, aims, and even values.

Modern science tries to explain the world without any reference to the observing individual himself; it describes the world, living beings included, from a third-person perspective only. Experience is restricted to objects that are given in time and space, as Kant taught. This new method is also correlated with a significant transformation in the function of mathematics. It no longer represents ideal forms which are true, good and beautiful; it describes the law which determines the development of the properties of an object. For Galileo and Johannes Kepler, the laws of nature are expressed in mathematical symbols, and are therefore no longer identical to the order of values. All reference to a first-person perspective being excluded, any reference to values must be excluded as well. Events have meaning only for living beings in their relation to them, and this re-

lation cannot be objectified empirically. Therefore, no ethical statements can be derived from the scientific concept of being. Yet science thus becomes separated not only from ethics, but from religion and aesthetics as well. Even such disciplines as astrophysics, evolutionary biology, geology, sociology, and psychology, which cannot meet the high methodological standards of physics (which for several centuries has been the paradigm of scientific research), are based on the exclusion of experiences which are directly tied to the observing subject. They, too, analyze how something has developed, but ignore the meaning of events and personal intentions.

Since the rise of modern science, therefore, the concept of nature presented by science has not been identical with the lived experience of nature. Consequently, the philosophy of nature, which includes human beings, and the philosophy of science, which deals with scientific theories only, constitute two different perspectives on nature. As Kant argued, a shift in the conditions of the possibility of experience implies a transformation of the concept of the object of recognition. Nevertheless, this would not be a problem if the philosophy of nature and the philosophy of science were accepted as two different yet equal methods. However, if scientific theories are deemed the only means of revealing the properties of certain objects, then the philosophy of nature must seem to be inexact, or even mere fantasy. Conversely, the same problem arises when, as in phenomenology, lived experience is taken as the basis of scientific theories, or, even worse, when science is ignored completely because it cannot reveal the essence of being. This separation of, and conflict between, science and philosophy thus became possible only with the development of modern science. Ever since then, discussions of whether and how these different perspectives might be reconciled have not come to an end. However, we should at least mention that it cannot be proved empirically that the method of science is indeed the highest form of cognition and that, consequently, the concept of truth must be defined scientifically as well. An attempt to explain everything scientifically, and so reduce philosophy to philosophy of science, is thus based not on science, but on personal conviction.

Beyond this, answering such questions is decisive for philosophy's understanding of itself and its position in interdisciplinary dialogue. Among the questions which arise are the following: 1. Should philosophy deal only with that type of experience which is immediately bound to the thinking and feeling subject? Is philosophy only phenomenology in the sense of Husserl? 2. Or should philosophy be reduced to philosophy of science, and deal with scientific conditions of recognition and scientific theories only? 3. Or should it deal only with a priori principles of cognition, ignoring empirical theories completely? If so, would philosophy not be deprived of all content and lose its relevance for guidance in daily life?

4. Or does philosophy have the special task of developing a synthesis of scientific theory and lived experience? If so, how is this synthesis to be realized? Must we accept the concurrent existence of different *Sprachspiele* that do not interfere with each other? Yet if we agree that the unity of human experience cannot be renounced, then an integration of these different perspectives will have to be undertaken. It is surprising that Gutting, in his detailed and well-elaborated introduction (p. 1), mentions only the first three alternatives stated above, but omits the fourth. This is all the more inexplicable given that the first article in this collection deals with the philosophy of nature of Hegel, whose speculative method is well known. Beyond this, there are many 20<sup>th</sup> century representatives of the fourth position, such as, for example, Max Scheler, Helmuth Plessner, Alfred North Whitehead, Hedwig Conrad Martius, and Hans Jonas. All of these authors deal intensively with modern science but also attempt to complement its insights, particularly with reference to experiences directly tied to living human beings.

### Gutting's Selection

Nevertheless, it is one of the main characteristics of modern Continental philosophy that science has by no means been ignored, but rather intensively discussed with respect to its method and its content. Gutting has selected a broad spectrum of philosophers, especially those of the French and the German tradition. All have developed different concepts of the relationship between science and philosophy, and have focused on different disciplines as well. The authors who present these different philosophies have been very well chosen. Some resemble Jean Gayon, who interprets the philosophy of Henri Bergson here, confessing that he initially had no personal interest in Bergson, and felt much more affinity with philosophy of science (p. 43f). Nevertheless, his interpretation shows that he has read quite a number of Bergson's essays and tried to understand his ideas, without resorting to concepts developed in another context. He presents Bergson's philosophy with great sensitivity and erudition. But Gayon's interpretation is only one example of the many very good introductions to very special philosophies here. It is one of the book's main characteristics that none of the authors criticizes or rejects the philosophy he presents, but rather tries to show its special point of view and the relevance of its main ideas. The book seeks to bridge the gulf between different philosophical schools by focusing on a guiding question: What relevance does modern science have for these philosophers, and how do they treat it? It is thus an excellent guide for all who are truly interested in learning something about Continental philosophy of science.

In order to illuminate this problem, the book offers a selection of eleven essays on philosophers of the 19<sup>th</sup> and, especially, the 20<sup>th</sup> century: Hegel, Bergson, Cassirer, Husserl, Heidegger, Bachelard, Canguilhem, Foucault, Deleuze, Irigaray and Habermas.

One might object that many important philosophers who also dealt with science are not mentioned here at all; that phenomenology is represented by Husserl and Heidegger alone, although science was much more important for Plessner, Scheler and Jonas; and that postmodernism predominates, even though for Deleuze and Irigaray in particular science is not in the focus of their interest. However, every book is finite, and must exclude many possible authors and topics. Moreover, most of these introductions do not concentrate on one author only, but instead show his or her interrelatedness with predecessors and contemporaries, who form the background upon which the philosophy of the given author is sketched. Nevertheless, the selection offered here clearly suggests that the editor considers these authors to be the most important representatives of Continental philosophy of science. An additional volume would undoubtedly be helpful, completing the survey with philosophers who have dealt with science as well as scientists who, due to their awareness of the limits of science, have dealt with philosophy.

All the introductions and commentaries are complemented by original texts from each philosopher. In this way, the reader is afforded an excellent opportunity to study their arguments in detail.

## Hegel

As already mentioned, the book begins with Hegel's philosophy of nature.<sup>1</sup> The main argument for this is that Hegel has had a wide-ranging influence on 20<sup>th</sup> century philosophy as well. He integrated the picture of nature that was emerging in the science of his time into a speculative interpretation of the dynamics of the entire world. Like Schelling, Hegel also demonstrated that nature is not merely an ensemble of material objects governed by mechanical laws, as Descartes had presumed; rather, it generates a multitude of visible forms. The opposition of matter and mind, which is at the basis of Kant's philosophy as well, must therefore be overcome. Further, the concept of history has to be applied to nature as well as culture. Neither can be separated from the other; instead, they are both part of a single process in which absolute consciousness develops by

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<sup>1</sup> G. W. F. Hegel, "Naturphilosophie" (pp. 35-39); commentary by Terry Pinkard, "Speculative *Naturphilosophie* and the Development of Empirical Sciences: Hegel's Perspective" (pp. 19-34).

dialectical steps. Nevertheless, as Terry Pinkard argues, Hegel's concept of nature cannot be accepted today:

The picture of the unity of nature that thereby emerges at the end of Hegel's treatment is not one that could be maintained today except by virtue of a rather weighty denial of a good bit of modern science itself. In particular, it rules out any Darwinian evolutionary account of life, and it rules out more broadly developmental accounts of the universe as a whole. But Hegel's own interest in the philosophy of nature lies with showing how the scientific picture still emerging in his own time was compatible with a conception of subjectivity as a normative status. Hegel's ambition in constructing a speculative *Naturphilosophie* may be summarized succinctly: one can have science *and* subjectivity without having to sacrifice one or the other. (Pinkard, p. 29f)

Although historical determinism must certainly be rejected today, and with it his attempt to realize the synthesis of matter and mind, the project itself is still highly important. One of the most prominent authors who tried to develop such a synthesis in the 20<sup>th</sup> century was Alfred North Whitehead. More recently, Hans Jonas has tried to bridge the gulf between matter and mind in nature, in living beings, and especially with respect to humans.

### **Bergson**

In his early years, Henri Bergson<sup>2</sup> was strongly interested in the theory of evolution formulated by Darwin and Spencer. Yet already in his dissertation thesis on the concept of time he dealt with the limits of the application of empirical science to human consciousness. He pointed out the difference between a concept of time based on measurement and one based on the internal organization of human consciousness. Unlike Hegel, Bergson did not rely on speculative arguments; like William James, he was convinced that the concept of experience had to be widened. We do not experience objects in space and time only; our inner life is also real. However, it is revealed only to a different mode of experience. Our conscious life cannot be described by reason, which proceeds analytically, but rather by intuition, which is able to transcend the division between the knowing subject and the known object, grasping both as a whole.

In his later writings, Bergson returned to the question that had occupied him in his youth: the evolution of life. He now had the proper instruments for elaborating the concepts needed to understand the creativity immanent in matter. Unlike Hegel, for Bergson this process is not

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<sup>2</sup> Henri Bergson, "Psychophysical Parallelism and Positive Metaphysics" (pp. 59–68); commentary by Jean Gayon, "Bergson's Spiritualist Metaphysics and the Sciences" (pp. 43–58).

a determined one. The permanent change of the conditions of life leads to new forms of life and, beyond this, to the genesis of new possibilities as well. Bergson tried to round out the theory of evolution by stressing the phenomenon of creativity. This approach strongly influenced the philosophy of Alfred North Whitehead and the theology of Pierre Teilhard de Chardin. Jean Gayon convincingly demonstrates that Bergson is by no means irrational:

We can now understand the program of Bergson's "positive metaphysics". First in psychology, then in neurology, then in evolutionary biology, and finally in physics, he claimed to have convincingly "refuted" a number of theories, or interpretations of theories, that were vitiated because they neglected the role and the meaning of time: the treatment of conscious states as magnitudes (psychophysics), the engramatic interpretation of memory in neurology, the "mechanistic" theories of evolution (especially Darwin). Bergsonian metaphysics finds its most powerful formulation when dealing with the opposition of sciences of matter and sciences of life (biology and psychology), which reveal the extent of mind in nature. (Gayon, p. 53)

### Cassirer

Cassirer<sup>3</sup> is another important author who was strongly interested in science throughout his entire life: from a historical perspective, with regard to the new theories of physics and biology and, finally, in his discussion of the role of science in culture. Ever since the Renaissance, argued Cassirer, the development of philosophy could not be understood without considering the development of science. Though each very often seems to be completely separate from the other, they are intertwined. The explanation of matter offered by physics led to the separation of matter and mind, which strongly influenced the philosophical systems of Descartes, Locke, Kant and even Hegel. Many philosophical problems can, therefore, be understood only against the background of modern science. Beyond this, in his "philosophy of symbolic forms" Cassirer demonstrates that science does not develop an objective picture of reality. Rather, it is based on a selection of data and its symbolic interpretation. Like language, art, myth and religion, science too is a symbolic interpretation of reality, and therefore an integral part of culture. Culture cannot be restricted to the humanities; rather, it embraces science and technology as well. The gulf between these "two cultures" can thus be bridged. As Michael Friedman summarizes it:

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<sup>3</sup> Ernst Cassirer, "From *Substance and Function*" (pp. 84-90); commentary by Michael Friedman, "Ernst Cassirer and the Philosophy of Science" (pp. 71-83).

We need a more comprehensive historiography (as particularly well exemplified in all of Cassirer's work), in which both the development of modern science and the parallel development of the modern philosophical tradition receive equal, and complementary, historical and philosophical attention. (Friedman, p. 81)

### Husserl

The philosophy of Husserl<sup>4</sup> develops from the conviction in his early writings that logic and science are “a triumph of the human spirit” (Tieszen, p. 93) to the much more skeptical thesis that science must be grounded in daily experience – which, however, cannot be explained scientifically. Quite the contrary, science is a product of human life. With this argument, Husserl rejects all reduction of daily experience to science; in fact, it is precisely the other way around. The sciences have “forgotten their origins in the everyday practices of the lifeworld” (Tieszen, p. 94). But the foundation of science in daily life gives rise to one decisive problem: What about all those effects which strongly influence daily life, yet cannot be observed directly? These effects can be observed only indirectly, by means of instruments based on the laws of physics: for example, radioactivity, the very long or very short wavelengths of sunrays, certain frequencies that cannot be heard yet may be measured, or chemical processes in the stars, which are the basis for life on Earth. Thus science transforms the concept of experience and widens its horizon, as we have argued above. If this is so, can daily life really be the basis of science? New perspectives do not influence theoretical debate only, but also have a highly important practical impact on daily life and ethics. Nevertheless, Husserl's philosophy represents a milestone in discovering the relevance of daily experience and the concept of intentionality, which is necessary for an understanding of human consciousness. As Richard Tieszen states:

Husserl's later philosophy contains an extensive critique of the modern sciences. This critique of what Husserl calls the “positive”, “naïve”, or “objective” sciences has been very influential in Continental philosophy and, in particular, in the retreat from holding science and technology up as models for philosophy. Philosophers like Heidegger, Merleau-Ponty, Ricoeur, Habermas, and Derrida, along with many others on the Continent, have been influenced by this part of Husserl's thought. (Tieszen, p. 93)

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<sup>4</sup> Edmund Husserl, “From *Introduction to the Logical Investigations* and from *The Crisis of European Sciences and Transcendental Phenomenology*” (pp. 113–120); commentary by Richard Tieszen, “Science as a Triumph of the Human Spirit and Science in Crisis: Husserl and the Fortunes of Reason” (pp. 93–112).

## Heidegger

Besides Husserl, Heidegger<sup>5</sup> has also strongly influenced the relationship between science and philosophy in the 20<sup>th</sup> century. The point of view elaborated here by Joseph Rouse may seem unusual at first glance: in general, Heidegger's philosophy, beginning with *Sein und Zeit*, is understood as a fundamental critique of positivism and scientism. His dictum "the sciences do not think" – meaning they are unable to reveal being – is very well known. Therefore, many philosophers who build their argumentation on Heidegger's philosophy reject any discussion of scientific results, regarding them as having no relevance for philosophy. Nevertheless, Rouse argues that Heidegger's philosophy constitutes a sort of naturalism, noting that "Heidegger's distinction between being and entities has been widely misunderstood" (Rouse, p. 124). Like his teacher Husserl, Heidegger begins his analysis with "our average, everyday activities", seeking to "work out the idea of a natural conception of the world" (Rouse, p. 124). Nevertheless, he rejects any epistemological reflections on daily life, as well as on science. In this respect, he comes very close to scientific naturalism, which holds that facts are recognized without the mediation of any methodological or conceptional framework. The sciences have the special task of discovering the occurrent; therefore, they have no ground in themselves, and need philosophy "in order to remain in the truth" (Rouse, p. 130):

Heidegger thus implicitly distinguished naturalism in philosophy from scientism. He joined the naturalists in arguing, against his neo-Kantian, phenomenological, and logical positivist contemporaries, that philosophy must begin from and remain within the horizon of our "natural" involvement with our surroundings in all its material and historical concreteness. (Rouse, p. 130)

This approach reveals a great affinity between scientific naturalism and "philosophical naturalism" (Rouse, p. 139).

## From Bachelard to Irigaray

The book continues with interpretations of French philosophers from Bachelard to Irigaray. While Bachelard, and especially Canguilhem, have a strong affinity with science, its influence decreases rapidly in the works of Foucault, Deleuze and Irigaray. Bachelard<sup>6</sup> tries to overcome the Car-

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<sup>5</sup> Martin Heidegger, "From *On 'Time and Being'*" (pp. 142–154); commentary by Joseph Rouse, "Heidegger on Science and Naturalism" (pp. 123–141).

<sup>6</sup> Gaston Bachelard, "From *Essai sur la connaissance approchée*" (pp. 176–184); commentary by Mary Tiles, "Technology, Science, and Inexact Knowledge: Bachelard's Non-Cartesian Epistemology" (pp. 157–175).

tesian framework of thinking. Inspired by the American pragmatists John Dewey and William James, he argues for “scientific knowledge as a process of approximation” (Tiles, p. 158). Reality, he concludes, can never be fully known, and so a “philosophy of the inexact” (Tiles, p. 160) is inevitable. As Mary Tiles summarizes it:

We should always be conscious of the imprecision at the qualitative and quantitative borders of phenomena. A central plank in [Bachelard’s] philosophy of approximation is that this negative judgment should be incorporated in any positive affirmation made. It is a remarkable testament to the persistence of the Cartesian/Newtonian mathematized mechanistic ontology that although other philosophers of science recognized the inevitable inexactness of all empirical detection and measurement, they did not build this into their representation of scientific knowledge but continued with representations in which concepts have sharp boundaries and sentences are either true or false. (Tiles, p. 162)

In contrast to Bachelard, Canguilhem<sup>7</sup> is convinced, like the positivists, that only science can reveal knowledge: “A knowledge which is not scientific is no knowledge; science and truth is the same” (Rheinberger, p. 188). Nevertheless, Canguilhem himself deals with the history of sciences only; his enterprise is fundamentally a historical one.

Foucault<sup>8</sup> follows the methodology of Canguilhem, but applies it to topics in social life: the history of madness, the history of punishment and, finally, the history of sexuality. Nevertheless, the main category which guides his analysis of these phenomena is that of power, a legacy from Nietzsche’s philosophy. For Foucault, every aspect of human life is determined by power, which penetrates the human mind and the human body as well. Humans cannot transcend the reach of power, for it is omnipresent. The different discourses in a society lead to a complex network in which human beings are nothing more than a node whose position and constitution change again and again. There is no truth and no essence of the human being. As Linda Martin Alcoff comments:

So what then of science? Foucault’s view makes possible the idea of struggling against a system of truth. Not to divest it from power, but to reorient its functionality and organizational relations. And in this, the political and epistemic motives cannot be easily segregated. One wants relief from the

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<sup>7</sup> Georges Canguilhem, “The Object of the History of Sciences” (pp. 198–210); commentary by Hans-Jörg Rheinberger, “Reassessing the Historical Epistemology of Georges Canguilhem” (pp. 187–197).

<sup>8</sup> Michel Foucault, “From *The History of Sexuality*, vol. I: *An Introduction*” (pp. 224–236); commentary by Linda Martin Alcoff, “Foucault’s Philosophy of Science: Structures of Truth / Structures of Power” (pp. 211–223).

disciplinary nightmare, certainly, but one also wants a fuller account of the truth about the human sciences themselves. (Alcoff, p. 222)

The work of Deleuze<sup>9</sup> is not focused on science; there are only a few references to it, “clipped, oblique, and occasionally hidden in footnotes” (May, p. 239). Nevertheless, as Todd May argues, “a more sustained investigation brings out a greater concern with and reference to science that runs throughout his work like a subterranean book of fire” (May, p. 239). Deleuze rejects transcendence and returns to immanence, aiming to reconcile the manifoldness of existence with the univocity of being. His main thesis is that being in its univocity is difference: “Difference is behind everything, but behind difference there is nothing” (May, p. 241). By means of these categories, Deleuze interprets molecular biology and the emergence of humans in the process of evolution: “The molecular level is a virtual realm of intensities, a field of differentiation that, through chance, differentiates itself into specific biological arrangements” (May, p. 246). The process of self-organizing matter is interpreted by means of the old categories of potentiality and actuality, though in contrast to Plato and Aristotle the emergence of new beings is not explained by eternal forms or the essence of being. “The virtual is a realm of differentiation out of which actualizations of diverse elements can appear. Matter preserves its potentiality for disparate combinations and novel actualizations at every point” (May, p. 249). Yet if there are no formal principles, then how can we explain why the same features are generated again and again and persist for a certain length of time? Whereas in antiquity being was the foundation of becoming, since the 19<sup>th</sup> century being has been supplanted by becoming. But do not we need both being and becoming to explain the long-lasting structures of our world? Could we survive if everything surrounding us were to change permanently into completely unpredictable manner?

According to Penelope Deutscher, the feminist philosopher Luce Irigaray<sup>10</sup> “will be seen as belonging to the human and inexact sciences” (p. 265). Dealing especially with psychology, Irigaray argues that anxieties arise “from the pervasive authority of science’s judgment” (Deutscher, p. 265). However, like the opposition “reason versus emotion”, anxieties too are only symptoms. What is really wrong is that “sexual difference is forgotten by science” (Deutscher, p. 273). Thus Irigaray asks us “to reflect more flexibly on the kinds of questions science does not take to be worth

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<sup>9</sup> Gilles Deleuze and Félix Guattari, “From *What Is Philosophy?*” (pp. 258–262); commentary by Todd May, “Gilles Deleuze, Difference, and Science” (pp. 239–257).

<sup>10</sup> Luce Irigaray, “In Science, Is the Subject Sexed?” (pp. 283–292); commentary by Penelope Deutscher, “On Asking the Wrong Question (‘In Science, Is the Subject Sexed?’)” (pp. 265–282).

studying, and to see in the areas which seem to us most preposterous and least plausible the expression of a cultural imaginary, rather than the neutrality or objectivity of practitioners” (Deutscher, p. 276).

### **Habermas**

Following this intensive discussion of French philosophers, the book returns once more to a prominent German philosopher, Jürgen Habermas,<sup>12</sup> a learned disciple of the Frankfurt School who has integrated some ideas from American pragmatism, especially the conviction that science is driven by interests. Together with Karl-Otto Apel, Habermas has

enlisted the support of pragmatism in order to uncover the anthropology of knowledge that comprised the background of the theoretical tradition passed on by Horkheimer and Adorno. Apel and Habermas made use of Peirce’s idea of the unending discourse of the community of researchers in order to clarify the conditions for the truth of social-scientific statements. (Honneth, p. 305)

Habermas’ main thesis is that the spectrum of scientific rationality is by no means exhausted by the instrumental interests involved in knowledge:

Alongside the natural sciences they granted to the historical-hermeneutic sciences as well an independent universal value by also referring the latter back to a practical interest they believed to be as deeply rooted anthropologically as the interest in gaining control over nature. (Honneth, p. 305f)

Science does not struggle for the truth of being; it is merely an instrument for the realization of special interests. Like Heidegger and Foucault, Habermas also follows the ideal of science that was first postulated by Francis Bacon. Though this tradition has been very powerful in the development of modern society, there is yet another one which is worth keeping in mind. Most of the great physicists, from Galileo all the way to Einstein and Bohr, tried to recognize at least a small fragment of reality. They did not strive for knowledge because they wanted to dominate the world, but because they wanted to discover the hidden structures of the universe.

### **Concluding Remarks**

By now it is evident that Continental philosophy of science is represented by a variety of positions. Nevertheless, one of the main points on which

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<sup>11</sup> Jürgen Habermas, “*Knowledge and Human Interests: A General Perspective*” (pp. 310–320); commentary by Axel Honneth, “*Bisected Rationality: The Frankfurt School’s Critique of Science*” (pp. 295–309).

most of them converge is the conviction that science cannot reveal the full range of reality, or even the essence of being. One of the most characteristic traits of Continental philosophy of science is, therefore, its attempt to elaborate a more complete picture of the world, one which takes into consideration lived experience and questions that are excluded by the methodology and concepts of science.