

# The Reception of Positivism in Whewell, Mill and Brentano

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**Abstract.** This article compares and contrasts the reception of Comte’s positivism in the works of William Whewell, John Stuart Mill and (to a lesser extent) Franz Brentano. It is argued that Whewell’s rejection of positivism derives from his endorsement of (what I shall call) a *constructivist* account of the inductive sciences, while Mill and Brentano’s sympathies for positivism are connected to their endorsement of an *empiricist* account. The mandate of the article is to spell out the chief differences between these two rival accounts. In the last, conclusive section, Whewell’s anti-positivist argument is briefly assessed, and rebutted.

This article compares and contrasts the reception of Auguste Comte’s positivism in the works of William Whewell, John Stuart Mill and (to a lesser extent) Franz Brentano. Admittedly, the central tenet of positivism is that positive sciences aim at discovering the laws of phenomena, that is, the “invariable relations of succession and resemblance” thereof – *and nothing more* (Comte 1852, 1:15; 1896, 1:2). This view has not been equally well received in British philosophy. While Mill, after Herbert Spencer, deems Comte’s lectures on *Positive Philosophy* “an essentially sound view of philosophy, with a few capital errors” (Mill 1865; 1985, 265), Whewell rejects positivism outright and maintains that Comte’s “opinions on the philosophy and history of sciences” are “of no value” (Whewell 1866, 353). A few years later, Brentano, in his well-known *Chilianeum* article, takes sides with Mill and readily states that “there is perhaps no other philosopher in recent times so highly deserving our attention as Comte himself” (Brentano 1869; 1926, 99)<sup>1</sup>.

The goal of the present study is to understand the main rationales behind these diverging assessments. I argue that the latter are best explained in light of the substantial disagreement between Whewell and Mill-Brentano on the nature of induction and the inductive sciences. Whereas these three

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<sup>1</sup> For a recent reconstruction of Comte’s influence on Brentano, see (Fisette 2018). See also (Schmit 2002).

authors lay stress on the importance of collecting facts and ascending from there to general propositions, they disagree on how the inductive scientist builds up his/her theories. Very roughly put, Whewell's rejection of positivism mainly derives from his endorsement of (what I shall call) a *constructivist* account of the inductive sciences, while Mill and Brentano's sympathies for positivism are connected to their endorsement of an *empiricist* account. The mandate of this article is to spell out the chief differences between these two rival accounts.

A fairly neutral vantage point will be needed to compare the views held by Whewell and Mill (and Brentano). My suggestion is that we walk in the steps of an imaginary inductive scientist and consider each step in turn, from the description of phenomena (Section 1) to their natural classification (Section 2) and their tentative explanation by means of a candidate theory (Section 3). For present purposes, I will assume without further argument that this three-step articulation roughly corresponds to a typical inductive process, broadly understood.<sup>2</sup> The core of this article will therefore consist in three sections, each of which will contain a brief exposition of Whewell's view of the issue at hand, followed with a short reconstruction of Mill's related objections. Section 4 will then offer a reply to the question of why Whewell rejects the main tenet of positivism while Mill and Brentano accept it. Finally, in the last, conclusive section (Section 5), Whewell's anti-positivist argument will be briefly assessed, and rebutted.

## 1. Describing the Phenomena

This first section briefly addresses Whewell's thoughts on the *description of phenomena* – a topic which, for obvious reasons, is common to his and Mill's considerations on the inductive sciences. I shall argue that, in spite of appearances, Whewell's view of description has a constructivist and anti-positivist flavour.

Before getting there, though, a few preliminary remarks are in order. Unlike Mill, who was a philosopher and a logician, William Whewell (1794-1866) was a philosopher and a renowned natural scientist. His most well-known scientific publications were in the areas of astronomy, physics and mechanics. In 1837 he published a scholarly treatise on the *History of the Inductive Sciences*, which shows evidence of in-depth knowledge of natural sciences such as chemistry, mineralogy, geology, zoology or botany. The philosophical counterpart of this historical treatise is his *Philosophy of the*

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<sup>2</sup> I won't address the topic of verification, which arguably is a fourth step in the formation of scientific theories. For a brief comparison of Whewell and Mill on this important topic, see (Forster 2011, 102 ff.; Scarre 1998, 127 ff.).

*Inductive Sciences* (1840), in which he exposes (what he takes to be) the leading principles underlying the making of scientific theories.<sup>3</sup>

On Whewell's view, inductive sciences (which he distinguishes from *pure sciences*, like geometry or algebra) are to be divided into several groups or classes, each of which has its own guiding principles and organising ideas. One of his main concerns precisely is to do justice to the varieties of inductive sciences. That said, he holds that clarifying the guiding principles of one class of sciences often has as a side effect to shed light on the guiding principles of *another* class, to the effect that metalevel investigations into various areas may prove mutually illuminating and let common inductive patterns emerge.

Interestingly, Whewell believes that there are some general principles which apply to all inductive sciences. Obviously, he admits of a crosscutting notion of induction as the "common process of collecting general truths from particular observed facts" (Whewell 1858a, 1:4). But above all, he grounds all his analyses on what he calls the "fundamental antithesis of philosophy." Very roughly, this is the Kantian-sounding view that human knowledge necessarily requires a combination or cooperation of two factors: thoughts and things, ideas and phenomena, conceptions and sensations, etc. Both are indispensable. For example, Whewell writes, "if I know that a solar year consists of 365 days, or a lunar month of 30 days, I know something about the sun or the moon; namely, that those objects perform certain revolutions and go through certain changes, in those numbers of days; but I count such numbers and conceive such revolutions and changes by acts of my own thoughts. And both these elements of my knowledge are indispensable" (Whewell 1858a, 1:24). There is a functional dependence between those two elements. Things are what scientific theories are about. Thoughts are what put the scientist in a position of talking about things and producing some substantial knowledge of them. To put it differently: "Ideas are the *Form*, facts the *Material*, of our structure" (Whewell 1858c, 72). The philosophy of scientific knowledge is analytic in the sense that it must distinguish the two elements and conceive of them with respect to their antithetic function – hence the idea of an "antithesis." This antithesis is said to be "fundamental" insofar as it underlies all human knowledge, making it possible at all. This thought is the backbone of Whewell's philosophy of the inductive sciences.

How does the fundamental-antithesis view bear on his understanding of the first step made by our imaginary scientist, the description of phenomena? His distinction between description, or *phenomenology*, and theory, or *etiology*, is introduced in order to account for an important class of inductive sciences, namely, that of so-called *paletiological* sciences – a term Whewell coined to refer to those inductive sciences which "endeavour to ascend to a past state, by considering what is the

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<sup>3</sup> The *History and the Philosophy of the Inductive Sciences* were written in parallel and were reissued in 1847 for the second edition and 1857/58 for the third edition.

present state of things, and what are the causes of change” (Whewell 1858b, 2:258). Geology, comparative philology and comparative archeology, despite their different subject matters, all belong to that class, and scientific investigations into the origin of the universe are another typical example of paleontology in Whewell’s sense. Taking geology as the best representative of paleontological sciences, Whewell claims that “each such science consists of two parts” corresponding to the knowledge of phenomena, on the one hand, and the knowledge of their causes, on the other. He writes: “The investigation of Causes has been termed *etiology* by philosophical writers, and this term we may use, in contradistinction to the mere *Phenomenology* of each such department of knowledge. And thus we should have *Phenomenal Geology* and *Etiological Geology*, for the two divisions of the science which we have above termed *Descriptive* and *Theoretical Geology*” (Whewell 1858b, 2:263). The relation between phenomenology and etiology is one of priority: phenomenology is prior to etiology. The phenomena at hand need to be described before one could look into their cause and, eventually, try to reconstruct the past state of things.

I will briefly return to the problem of causation in Section 5. For now, let me focus on Whewell’s theory of description. Drawing on his fundamental-antithesis view, he holds that any description, however minimal, already involves a subjective component, an “activity of the mind.” To be sure, the adoption of a descriptive terminology cannot be arbitrary. As shown by the case of botany, it implies “an extensive and accurate acquaintance with the facts of nature” (Whewell 1857, 3:260). Yet, according to the fundamental antithesis of philosophy, the facts of nature are but one of the two elements of human knowledge. Facts require thoughts in order to be described, which means that the description of facts already is theory-dependent. Whewell goes as far as saying that “we cannot observe any phenomena without applying to them such Ideas as Space and Number, Cause and Resemblance, and usually, several others” (Whewell 1858c, 54). If this applies to observation, this is all the more true for description. There is no theory-independent description of the phenomena. One of the most important consequences of this view is that there is no clear-cut boundary line separating facts from theories. As Whewell puts it, “a true Theory is a fact, a Fact is a familiar Theory” (Whewell 1860, 467). Furthermore, for him, *every* arrangement of phenomena brought about by the mind, or by the intellect, should be considered an *induction* in a broad sense: “Induction for us is general propositions, *contemplated as such*, derived from particulars” (Whewell 1860, 245). As a result, the mere description of the phenomena already is an inductive process in Whewell’s eyes.<sup>4</sup>

Mill explicitly challenged this account of description in his *System of Logic* (1843; henceforth, *System*). True, he agrees that there is no “neutral” description, which would not go beyond the mere

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<sup>4</sup> “The formation of good descriptive language is, in fact, an inductive process of the same kind as those which we have already noticed in the progress of natural history. It requires the *discovery of fixed characters*” (Whewell 1857, 3:261). Induction, in Whewell’s eyes, is not an inferential process at all. Yet, I won’t say more about that here. For a reconstruction, see (Snyder 2008).

observation of facts/phenomena. He writes: “We cannot describe a fact, without implying more than the fact. The perception is only of one individual thing; but to describe is to affirm a connexion between it and every other thing which is either denoted or connoted by any of the terms used” (System IV.1.3; Mill 1974, 644). Brentano agrees.<sup>5</sup> Yet, neither Mill nor Brentano take the mere description of phenomena to be an induction. Against Whewell, they refer to the classical, Aristotelian understanding of induction as an inference from the known to the unknown.<sup>6</sup> After Mill, Brentano himself defines induction in the narrow sense as the “inferential procedure which leads us from the experience of one or several facts to the assumption of a general law, under the presupposition of which the facts appear as necessary” (Brentano 1970, 75).<sup>7</sup> Whewell’s view of induction clearly is broader than that. Mill aptly summarizes it by saying that “Whewell calls nothing Induction where there is not a new mental conception introduced, and everything induction where there is” (System III.2.5; Mill 1974, 304–5). Mill himself, on the contrary, argues that description and induction must be distinguished as separate processes. Description may pave the way to induction, it precedes it without being itself an inductive process (System IV.1.3; Mill 1974, 645).

Why should we separate description and induction? The bulk of Mill’s objection is that Whewell’s theory of description conflates a sum of observations with an induction in the proper sense of the term. As I interpret it, the argument runs like this: 1) induction is inferential, it is inferring from the known to the unknown; 2) when I describe several facts by means of a single proposition, I just make a sum of several observations; 3) making a sum of several observations is not inferring from the known to the unknown; therefore, 4) when I describe several facts by means of single proposition, there is no induction involved. Mill illustrates this argument by means of the following example:

“A navigator sailing in the midst of the ocean discovers land: he cannot at first, or by any one observation, determine whether it is a continent or an island; but he coasts along it, and after a few days finds himself to have sailed completely round it: he then pronounces it an island. Now there was no particular time or place of observation at which he could perceive that this land was entirely surrounded by water: he ascertained the fact by a succession of partial observations, and then selected a general expression which summed up in two or three words the whole of what he so observed. But is

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<sup>5</sup> He explicitly paraphrases this passage in the third (unpublished) book of his *Psychology from an Empirical Standpoint*, see Brentano, Unpublished manuscript Ps 53, p. 53002-53003: “Every description involves, as John Stuart Mill rightly insists, more than the perception; it involves some comparison and interpretation” (*Jede Beschreibung enthält, wie John Stuart Mill mit Recht hervorhebt, mehr als die Wahrnehmung; sie enthält Vergleich und Deutung*).

<sup>6</sup> See, e.g., System III.2.1; Mill 1974, 288: “Induction, then, is that operation of the mind, by which we infer that what we know to be true in a particular case or cases, will be true in all cases which resemble the former in certain assignable respects [...]. Induction, as above defined, is a process of inference; it proceeds from the known to the unknown.”

<sup>7</sup> On Brentano’s further distinction between induction in the broad sense and induction in the narrow sense, see (Bergman 1944; reprinted in McAlister 1976, 213–23).

there anything of the nature of an induction in this process? Did he infer anything that had not been observed, from something else which had? Certainly not” (System III.2.3; Mill 1974, 292).

To put it differently, general propositions entering into our descriptions of the phenomena certainly imply something like a “colligation of facts,” but there is not reason, Mill argues, to call that an inductive process.

Whewell extensively replied to this objection by stressing, again, the theory-ladenness of any description. His main point is that “there is no definite and stable distinction between Facts and Theories; Facts and Laws; Facts and Inductions. Inductions, Laws, Theories, which are true, *are* Facts. Facts involve Inductions” (Whewell 1860, 250). Accordingly, the colligation of facts never is a mere sum of observations: it is a sum of observations “*seen under a new point of view*” (Whewell 1860, 256). On the face of it, this might look like a merely verbal disagreement, a disagreement about the meaning of the terms “induction” and “inductive.” Whewell and Mill agree that every description is theory-laden. The only difference seems to be that Whewell calls any theory-laden description an “induction,” while Mill takes the description to be merely “subsidiary to induction” and identifies the latter with an inference from the particular to the general. However, for reasons which I hope will become clear in the remaining of this paper, this dispute is not only terminological. Rather, there is a substantial disagreement between Whewell and Mill on the nature of the inductive sciences (see Forster 2011).

## 2. Classifying the Phenomena

The first step of our virtual inductive process was the description of the phenomena, a step which already is inductive (or theory-laden) in Whewell’s view whereas, for Mill (and Brentano), it is merely subsidiary to induction, the latter being classically understood as an inference from the known to the unknown. Now, Whewell claims, “*phenomenology requires classification.*” He spells out this idea as follows: “The Phenomenal portions of each science imply Classification, for no description of a large and varied mass of phenomena can be useful or intelligible without classification. A representation of phenomena, in order to answer the purposes of science, must be systematic” (Whewell 1858b, 2:265). The purpose of classifying is to make general propositions—propositions about an entire class of phenomena—possible (Whewell 1857, 3:164). Now phenomena are likely to be classified in many ways. Yet, only a *natural* classification will be relevant from a scientific point of view, that is, in order to produce some substantial knowledge.

What, then, makes a classification *natural*? Whewell wrote rather extensively on this subject matter. Yet, for present purposes, a few remarks will suffice to compare his position to Mill’s. Very roughly, both Whewell and Mill agree that a natural classification has to be based on *several* marks or characters. For example, Whewell argues that “*no one* character can be imperative in a natural

method” (Whewell 1857, 3:282). What makes a class natural is not the existence of one single common character. Rather, the characters must be “all taken together” (Whewell 1858c, 229). Similarly, Mill insists that the members of a natural class share a *virtually unexhaustible* number of common properties, some of which already known and others yet to be discovered (System I.7.4.; Mill 1974, 123).

This superficial agreement, however, must not conceal the significant divergences between them. The main disagreement certainly has to do with the role of *types* in natural classification. For Whewell, class-membership is determined by the resemblance to a type, that is, a member which is taken to be particularly representative of the class. He opposes the method of type to the method of definition. It is not true, Whewell argue, that the inductive scientist, in order to decide whether some given phenomenon belongs to a class, compares the phenomenon to a general definition. Sometimes, such a definition is even lacking, or cannot be given without arbitrariness. The actual procedure rather consists in comparing the said phenomenon to a *type*:

“The principle which connects a group of objects in natural history is not a definition but a type. Thus we take as the type of the Rose family, it may be the common wild rose; all species which resemble this flower more than they resemble any other group of species are also roses, and form one genus [...]. And thus the Rose family is collected about some one species which is the type or central point of the group” (Whewell 1840, 2:518).

Moreover, Whewell goes on, finding an organising type is not just a matter of observation. It requires some skilfulness: “To detect the true principles of Natural Classes, and to select marks by which these may be recognized, are steps which require genius and good fortune, and which fall to the lot only of the most eminent persons in each science” (Whewell 1858b, 2:265). Everyone is able to observe the phenomena, and yet not everyone is able to group them in a way which makes relevant scientific propositions about them possible (more on that in Section 5 below).

Mill disagrees. Although the reference to a type might help us make the first steps toward a classification, the *rationale* behind class-membership always is the possession of common *characters* which are (or may be) *perceptually given*. He writes: “Though the groups are suggested by types, I cannot think that a group when formed is *determined* by the type; that in deciding whether a species belongs to the group, a reference is made to the type, and not to the characters” (System, IV.7.4; Mill 1974, 721). As I have suggested elsewhere (Dewalque 2018), it is probably not incorrect to say that Brentano follows Mill on that score, too. What matters for class-membership is not the resemblance to a type but the presence (or absence) of defining characters. Here again, Mill and Brentano have it that those characters are simply discovered in the phenomena by means of observation. In other words, they are not constructed but perceptually given.

### 3. Building up a Theory

I now turn to the third step, which consists in building up a hypothesis. We already saw that, on Whewell's view, for the phenomena to be described and classified is for them to be arranged according to ideas and conceptions, whose discovery is not a matter of observation but of *invention*. This already suggests that the making of a scientific theory requires some inventiveness. On his view, most scientific advances are the result of what may be called "happy guesses": they come from "felicitous and inexplicable strokes of inventive talent" (Whewell 1858c, 64). As a consequence, it would be vain to try to formulate a rule which could be applied in each case with equal promise of success. Above all, for Whewell, this means that the facts are not self-sufficient. The crucial step to build up a theory consists in *adding a conception to the facts*. This is another application of the "fundamental antithesis of philosophy." At some point, the phenomena suddenly appear in the light of a novel conception, which is entirely subjective in the sense that it originates in the scientist's mind: "There is a Conception of the mind introduced in the general proposition, which did not exist in any of the observed facts" (Whewell 1858c, 72). And according to the "fundamental antithesis" view, the conception is not given by the phenomena, since it precisely is an element which is alien to the phenomena. Rather, Whewell says, it is "superinduced" upon them (Whewell 1858c, 74).

Here again, Mill disagrees. True, he is happy to acknowledge that a conception is selected by a skilful guess. But why should the conception be purely subjective in Whewell's sense? Why should it be "added to the facts" it is supposed to account for? The thought of a mind already equipped with ideas, or even with seeds of ideas, strikes Mill as contrary to the principles of scientific inquiry. And indeed, it is incompatible with his empiricist account of the inductive sciences. Whatever conception comes to the mind of the scientists, it is abstracted from the phenomena themselves:

"The conception of an ellipse must have presented itself to Kepler's mind, before he could identify the planetary orbits with it. According to Dr. Whewell, the conception was something added to the facts. He expresses himself as if Kepler had put something into the facts by his mode of conceiving them. But Kepler did no such thing. The ellipse was in the facts before Kepler recognised it; just as the island was an island before it had been sailed round. Kepler did not *put* what he had conceived into the facts, but *saw* it in them. A conception implies, and corresponds to, something conceived: and though the conception itself is not in the facts, but in our mind, yet if it is to convey any knowledge relating to them, it must be a conception *of* something which really is in the facts, some property they actually possess, and which they would manifest to our senses, if our senses were able to take cognizance of it" (System III.2.4; Mill 1974, 295).

Mill's contention, then, is that Whewell conflates two distinct claims: (1) the theory-ladenness of description, (2) the a priori character of conceptions. Again, (1) is uncontroversial, Mill says, but (2) is very likely to be challenged:

“No one ever disputed that in order to reason about anything we must have a conception of it; or that when we include a multitude of things under a general expression, there is implied in the expression a conception of something common to those things. But *it by no means follows that the conception is necessarily preexistent, or constructed by the mind out of its own materials*” (System III.2.4; Mill 1974, 296; my emphasis).

In order to yield substantial knowledge *of* some facts, my description must capture something in the facts themselves. Thus, for Mill, the inductive scientist *sees* the conception *within* the facts themselves.

To this, Whewell replies that Mill's affirmation is not compatible with skilful guessing. Not everyone is able to discern the conception in the facts. It takes much more than just opening one's eyes and taking in the facts as they are given. It demands some *invention*, hence some operation of the mind. The opposition is neatly summarized by Whewell in his *Philosophy of Discovery*, and it is spelled out, again, by means of the “fundamental antithesis of philosophy”: “To me it appears that there are *two* distinct elements in our knowledge, Experience, without, and the Mind, within. Mr. Mill derives all our knowledge from Experience *alone*” (Whewell 1860, 286).

Let me take stock. The brief reconstruction offered in this and the preceding sections shows that Whewell's and Mill's theories of the inductive sciences are not without similarities. They both acknowledge the *theory-ladenness* of description (no description is entirely conception-free or theory-independent), they agree that, for a description to be scientifically relevant, it has to go hand in hand with a *natural* classification of the phenomena, and they agree that natural classifications are based on *several* marks or characters, some of them already known and some yet to be discovered. Yet, they strongly disagree on the role of the mind in the inductive processes, broadly understood. On Whewell's view, the mind plays an active or *constructive* role all the way down from the description of the phenomena to the building up of candidate theories: it is the source of the guiding ideas or organising conceptions which underlie our descriptions, it selects some types and refers to them to arrange the phenomena into natural classes, and it creates novel conceptions which are responsible for the emergence of scientific theories. For the sake of convenience, we can call this a *constructivist* approach to the inductive sciences. Mill goes in the opposite direction and emphasizes the mind's passivity or *receptivity*: our descriptions, albeit theory-laden, do not presuppose non-empirical ideas whose source should be located in the mind, natural classes are based on the possession of common characters which are perceptually given or observable, and the guiding ideas underlying scientific

theories are abstracted *from* the facts – not added *to* them. In short, while Whewell’s approach to the inductive sciences is widely constructivist, Mill’s rival approach bears the mark of *empiricism*. Experience is, for him, the only source of all the organizing conceptions which are needed to describe, classify, and explain the phenomena. Keeping this difference in mind, I submit, is crucial when it comes to understanding Whewell’s and Mill’s respective assessments of Comte’s positivism.

#### 4. Whewell’s Argument Against Positivism

Recall the central tenet of positivism: positive sciences aim at discovering the laws of phenomena – *and nothing more*. In Mill’s words: “We have no knowledge of anything but phenomena; and our knowledge of phenomena is relative, not absolute. We know not the essence, nor the real mode of production, of any fact, but only its relations to other facts in the way of succession or of similitude” (Mill 1985, 265; see also Whewell 1860, 226). Thus understood, positivism mainly rests upon a limitation claim, although it certainly involves a positive side as well. We are now in a position to understand Whewell’s reception of positivism and to contrast it with Mill’s and Brentano’s. In this section I argue that the chief target of Whewell’s objections is the limitation claim, according to which positive (or inductive) sciences are only concerned with relations between phenomena, *and nothing more*. The goal of this section is to reconstruct Whewell’s critique of this claim. Although it is my contention that his critique fails because of his biased understanding of Comte’s positivism, I will confine myself here to reconstructing Whewell’s objection as accurately as possible and postpone its critical assessment to the next section.

What is, then, Whewell’s main charge against Comte? The preceding reconstruction shows that, on Whewell’s view, each stage of the making of a scientific theory involves an activity of the mind. “Ideas” – or, as he puts it, “conceptions” – are “added” to the facts and enable the scientist to describe them, make general assertions about them, and build up a tentative theory of them. The constructivist spirit of this view is neatly summarized in the following passage: “There is a special process in the mind, *in addition* to the mere observation of facts, which is necessary *at every step in the progress of knowledge*” (Whewell 1860, 260; my emphasis). Now positivism, Whewell argues, is at odds with this view. By insisting on the observation of phenomena alone, positivism does not do justice to this intellectual process, that is, to the ‘subjective’ ingredient of knowledge. Whewell writes: “‘Positive philosophy’ is positive mainly in *denying* all but facts – all abstractions, causes, theories, and the like” (Whewell 1866, 354).<sup>8</sup> To this, he objects that “the facts cannot be *expressed* without the theory” (Whewell 1866, 355). In other words, Whewell takes it (wrongly, as I shall suggest in Sect. 5) that positivism simply fails to account for the dual character of knowledge and, more pointedly, for the

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<sup>8</sup> As suggested in Sect. 5 below, Brentano will defend Comte against this objection.

arrangement of phenomena/facts according to *ideas*.<sup>9</sup> In sum, his contention is that positivism neglects the role of ideas. In Whewell's view, this is a very serious shortcoming of Comte's position, for it is hopeless to try to express the laws of phenomena without referring at the same time to the organizing ideas according to which phenomena are made intelligible to us. Furthermore, in most cases, these ideas were introduced due to metaphysical considerations and cannot be entirely disconnected from the latter. As Whewell puts it: "There is no science in which the expression of the laws of phenomena can at this time dispense with ideas which have acquired their place in science in virtue of metaphysical considerations" (Whewell 1860, 227). As a result, Whewell has it that "metaphysical discussions have been essential steps in the progress of each science" (Whewell 1860, 228) and that positivism, by arguing for a divorce between positive science and metaphysics, overlooks the metaphysical dimension of scientific progress.

A telling example of the positivism's neglect for ideas, Whewell argues, is offered by Comte's position toward causal explanations. For Whewell, causal explanation is an essential part of the inductive sciences, which is tantamount to saying that the inductive sciences, at some point, cannot dispense with the arrangement of phenomena according to the idea of *cause*. We have seen that, in so-called paleontological sciences for example, the description of phenomena (termed *phenomenology*) must be followed with an examination of what caused them (*etiology*). Admittedly, looking into the causes of phenomena certainly is an essential endeavour of the inductive sciences in general. The trouble with Comte's positivism is that, in Whewell's interpretation, it "rejects all inquiry after causes, which inquiry [Comte] holds to be void of sense and inaccessible" (Whewell 1860, 226). This, Whewell believes, is a direct consequence of Comte's unilateral concern with the factual/phenomenal component of the inductive sciences.

Therefore, one way of reconstructing Whewell's overall argument against positivism<sup>10</sup> is as follows:

1. A general theory of the procedures employed in the inductive sciences is satisfying only if it accounts for all the essential components of the latter.

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<sup>9</sup> This problem is not new. In fact, Whewell charges Bacon, the champion of inductivism, of having committed the same mistake: "The disposition to ascribe our knowledge to observation alone, had already, in Bacon's time, led him to dwell to a disproportionate degree upon that half of his subject" (Whewell 1860, 201). There are two issues with Whewell's appreciation of positivism here. First, Whewell merely overlooks Comte's view that facts or phenomena cannot be described without making theoretical assumptions (see Sect. 5 below). Second, he takes it for granted that facts are organized by means of "ideas," whereas in Comte's view they are subsumed under *laws*. This suggests that Comte *does* appreciate the "subjective dimension" of cognition, although (unlike Whewell) he does not think of it in Kantian terms.

<sup>10</sup> True, Whewell seems to put forth *several* arguments in his (Whewell 1866). Yet, it is probably not unfair to regard them as various ways of spelling out the one objection which is formulated here.

2. The procedures employed in the inductive sciences rest on the combination of two equally essential components, a subjective component (which consists of “ideas”) and an objective one (which consists of phenomena/facts).

Therefore,

3. A theory of the inductive sciences is satisfying only if it accounts for those two components, the subjective one and the objective one.
4. Positivism does not account for the subjective one: it is blind to “ideas.”

Hence,

5. positivism is not a satisfying theory of the inductive sciences.

We can now answer the question raised in the opening paragraph of this article. Whewell’s rejection of positivism is commanded by (what I have called) his constructivist account of the inductive sciences. On this account, the intellect plays an active role at each stage of the making of scientific (i.e., knowledge-producing) theories, from the classification of the observed facts to the verification of the candidate theory. Whewell, not unlike Kant, conceives of the intellect’s activity as the addition of “fundamental ideas” to the data of experience. And yet, his fundamental ideas differ from Kant’s categories in various respects. He does not distinguish between forms of the sensibility and pure concepts of the understanding, nor does he conceive of fundamental ideas as full-blown innate or a priori concepts. Rather, they are like seeds or *germs* that belong to the constitution of our intellect and are likely to grow up when we exercise our power of knowing (see Snyder 2008, 179).

As we have seen, this view must be contrasted with the empiricist (Aristotelian) approach to the inductive sciences that Mill and Brentano advocated. While they agree that there is no conception-free description or classification, Mill and Brentano most decidedly reject the view that the intellect *adds* something to the phenomena. Whatever idea or concept is employed to arrange the data of experience, is contained *within* the phenomena (so to speak) and enters the intellect of the observer through the observation of the phenomena themselves. Because they are professed empiricists, Mill and Brentano, unlike Whewell, do not reject Comte’s positivism outright. Rather, they want to correct more or less important flaws in Comte’s exposition of positivism and, in Brentano’s case, demonstrate the compatibility of the latter with metaphysics in general and theism (i.e., the thought that there is a world-creating God) in particular.

Many aspects of Mill’s and Brentano’s reception of positivism have not even been touched in what precedes. Yet, it is my contention that the proposed reconstruction throws light on some important background components of Brentano’s philosophical programme. First, Brentano’s

insistence on the distinction between descriptive psychology and genetic psychology (Brentano 1982; 1995), arguably, may be traced back to Whewell's considerations on the phenomenological part of inductive sciences (Hedwig 1989). The question of how to classify phenomena in general, and mental phenomena in particular, is also central to both Whewell and Brentano. Yet, it is important to recall that Brentano does not share Whewell's anti-essentialist account of classification in terms of "resemblance to a type" (see Dewalque 2018). Next, Mill's critique of Whewell's constructivist or "neo-Kantian" view of the making of scientific theories might be seen as an important historical prelude to Brentano's own anti-Kantianism. Finally, central to Brentano's metaphilosophy is the claim that philosophy is itself an inductive science, albeit one which also admits intuitively warranted, self-evident axioms.<sup>11</sup> This is certainly one of Brentano's most intriguing theses – and one which obviously presupposes a background understanding of what induction is. Thus, the proposed reconstruction might pave the way to a better understanding of Brentano's metaphilosophy, too.<sup>12</sup>

Putting interpretive concerns aside, I now want to briefly assess the cogency of Whewell's anti-positivist argument. This will be the business of the last, conclusive section.

## 5. A Brief Assessment of Whewell's Argument

Recently, Whewell's constructivist account has been subject to a significant surge of interest. For example, it has been argued that his insistence on the "genius" is takes to organize chaotic data into a coherent scientific account may be seen as "complimentary" to Mill's empiricist account of scientific discovery (Scarre 1998, 135), that his "broad" view of induction, *pace* Mill, was more a benefit than a liability (Snyder 2008; Forster 2011), that his anti-essentialist theory of classification anticipated Wittgenstein's theory of family likeness (Wilkins 2013, 225), and that his theory of consilience was endowed with real explanatory value (Quinn 2017). Yet, what about Whewell's fundamental-antithesis view and his ensuing anti-positivist argument? As reconstructed in the previous section, this argument is valid. The main job is done by premises 2 and 4 – or P2 and P4 for short. These are likely to be challenged, though. To conclude, I shall suggest that Whewell's support for P2 and P4 is rather weak. As a result, I think we should not be impressed by his anti-positivist argument.

As far as I can see, three independent sub-arguments may be found in Whewell's work in support of P2. Yet, none of them seems to me to be entirely cogent. One first argument is a mere *argument from authority*. The "fundamental antithesis of philosophy," Whewell argues, is "familiar and generally recognized" (Whewell 1858a, 1:23). This argument simply says that many authors acknowledged the distinction between the two ingredients of knowledge, although this distinction has

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<sup>11</sup> On the claim that philosophy is an inductive science, see (Brentano, Ms. H45, 25277, 25324; quoted in Brentano 1987, xv, 10–11). On the distinction between intuition and inductive inference, and the claim that intuition itself may be conceived of as an "induction in the broad sense," see (Brentano 1970, 72–4).

<sup>12</sup> This, however, should be the topic of another paper.

been put in many different ways (thoughts vs. things, theories vs. facts, etc.). For obvious reasons, this argument, like any argument from authority, may be discarded out of hand.

Another support for P2 lies in what we may call the *argument from necessary truths*. It runs like this: 1) if there were no non-empirical concepts (e.g., space), there would be no necessary truths (e.g., geometrical axioms); 2) there are necessary truths; therefore, 3) there are non-empirical concepts.<sup>13</sup> It is not clear how the conclusion of this argument exactly connects with P2, but I won't say more about that (it seems that, for Whewell, the existence of non-empirical concepts speaks for the “fundamental antithesis of philosophy”). The weakest premise in the argument from necessary truths is the first one. It is connected to the Kantian-sounding view that there is another source of knowledge (namely, pure reason) above and beyond experience and observation.<sup>14</sup> Mill already challenged this view when he maintained that “axioms are but a class [...] of inductions from experience,” to the effect that “Deductive or Demonstrative Sciences are all, without exception, Inductive Sciences” (System II.6.1; Mill 1974, 253). More pointedly, as soon as one demonstrates, as Brentano and Stumpf did (Brentano 1970, 25 f.; Stumpf 1939, 1:6–7), that true propositions made up of empirical concepts may be necessary true – a thought which seems well established today –, the first premise of Whewell's argument from necessary truths turns out to be false and the argument collapses. The existence of necessary truths (i.e., necessary *judgements*) does not require the existence of non-empirical concepts (a priori *presentations*).

A third, arguably more original sub-argument in support of P2 is the *argument from skilfulness*. As I interpret it, it runs like this: 1) if there were no subjective component involved in every inductive process, everyone would be able to derive general propositions from the mere observation of facts; 2) not everyone is able to derive general propositions from the mere observation of facts; therefore, 3) there is a subjective component involved in every inductive process. This argument rests on Whewell's idea of ‘skilful guessing.’ As we have seen, the inductive scientist, for him, does not conform to strict inferential schemes. Rather, he tries to guess whatever general theory could best accommodate the particular facts. This is not a lucky guess, but a skilful guess, one which requires competences that only a handful of people possess. Yet, here again, I think the argument may be resisted. One way of doing so is to challenge the first premise according to which, if there were no subjective component involved in every inductive process, everyone would be able to derive general propositions from the mere observation of facts. The empiricist could reply that, although some psychological and material conditions must be fulfilled in order to *see* the idea *within* the phenomena,

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<sup>13</sup> I use the phrase “non-empirical concepts,” for Whewell's “fundamental ideas” are not full-blown a priori concepts in Kant's sense.

<sup>14</sup> Whewell claims that fundamental ideas “possess a power of infusing into their developments that very necessity which experience can in no way bestow” (Whewell 1858a, 1:76). The right conclusion to draw from Hume's scepticism is that, since some of our ideas do not have experience as their source, “we have some other source of knowledge than experience” (Whewell 1858a, 1:77).

these conditions do not include any ‘subjective component’ in Whewell’s sense. For example, it is pretty obvious that, if one is exhausted, or distracted, the defining characteristics of the phenomena will be more difficult to pin down. Moreover, it may be argued that noticing the commonalities between various phenomena is a task which takes time and requires a good deal of practice. Empiricists counter-arguments along those lines may be found in Brentano’s lectures on *Descriptive Psychology* (Brentano 1982; 1995). If such counter-arguments are sound, then the fact that not everyone is capable of discovering the laws of phenomena does not force us to acknowledge the existence of ‘fundamental ideas’ or ‘conceptions’ in Whewell’s sense. In other words, nothing forces us to accept the thought of a substantial ‘subjective’ contribution of the mind to the *content* of a scientific theory. For what we know, all the presentations entering into our judgements (even presentations such as ‘space,’ ‘time,’ ‘existence,’ ‘necessity,’ and the like) might well come from the (perceptual) experience of (mental and physical) phenomena.

So much for P2. What about P4? Whewell’s argues that positivism unduly reduces the whole inductive process to (the registering of) facts/phenomena, hence is blind to the subjective component he calls ‘fundamental ideas’ and ‘conceptions.’ Once again, Whewell argues that “the facts cannot be *expressed* without the theory” (Whewell 1866, 355). Yet, as we have seen, Mill and Brentano fully agree with that. Although they reject the thought of non-empirical concepts, they nonetheless agree that every description is conceptually laden. Furthermore, as Brentano clearly saw (Brentano 1987, 250), Comte himself explicitly professes the same opinion: “If it is true that every theory must be based upon observed facts, it is equally true that facts cannot be observed without the guidance of some theory. Without such guidance, our facts would be desultory and fruitless; we could not retain them: for the most part we could not even perceive them” (Comte 1896, 1:4). The situation, therefore, seems to be this. The charge of neglecting the ‘subjective’ component of knowledge is likely to be understood in two ways. Either it means that Comte’s positivism is blind to the existence of non-empirical concepts, or it means that it is blind to the theory-ladenness of any description and classification. In the first case, we already find out some reasons of challenging Whewell’s claim that there are non-empirical concepts. In the second case, Whewell’s objection against positivism seems to rest on a mistaken interpretation of positivism.

Still, perhaps there is a *third* sense in which positivism is exceedingly restrictive and does not do full justice to the construction of the inductive sciences. Another sub-argument Whewell employs for P4 rests upon the claim that positivism rejects any inquiry into causes: “The study of really progressive science teaches us that the first step in a science is to discover the laws of phenomena; and that from these laws alone, ascending from one step of generality to another, we can hope to discover those very general laws which we call *causes*. But, when such general laws offer themselves, why should we not call them *causes*, when all the world calls them so?” (Whewell 1866, 356). However,

this seems to be just another mistaken interpretation. Positivism does not condemn *any* kind of causal inquiry. It only rejects first and final causes. Here again, Brentano aptly emphasised this point in his *Chilianeum* article and in his Würzburg lectures on positivism (Brentano 1926, 116; 1987, 255–57).

To sum up, the crucial premises of Whewell’s anti-positivist argument are P2 and P4. If the preceding critical remarks are correct, then P2 is philosophically disputable while P4 is interpretively disputable. I therefore conclude that Whewell’s anti-positivist argument has no real cogency.

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