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Historicizing Hermann von Helmholtz's Psychology of Differentiation

Liesbet De Kock

Nineteenth-century scientist Hermann von Helmholtz's peculiar wavering between empiricism and transcendentalism in his philosophy of science in general, and in his theory of perception in particular, is a much debated and well-documented topic in the history and philosophy of science. This contribution aims at providing a fresh angle on this classical issue, by considering Helmholtz's account of differential consciousness against the background of a centuries-old philosophical debate between the (strict) empiricist tradition and the tradition of transcendental idealism. By placing Helmholtz's psychology against the background of a historical narrative stretching from Hume to Fichte, one can gain insight into the possible merits of his empirico-transcendentalism with regard to the problem of differentiation. More particularly, it is argued that Helmholtz's psychology tilted towards transcendentalism when met with the classical theoretical problems of strict empiricism in dealing with the foundation of consciousness, most notably circularity and infinite regress. Without claiming that Helmholtz's theorizing presented a self-conscious attempt to overcome the latter issues, his well-known wavering between perspectives in general, and his appropriation of the *a priori* in particular, might have served him well in avoiding the deadlocks of empiricism. As noted at the end, however, Helmholtz's account produced complex philosophical problems of its own.

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1. Introduction

Nineteenth-century scientist Hermann von Helmholtz's peculiar wavering between empiricism and transcendentalism in his philosophy of science in general, and his theory of perception in particular, is a much debated and well-documented topic in the history and philosophy of science.¹ This contribution aims at providing a fresh angle on this classical issue, by considering Helmholtz's account of *differential consciousness*—i.e., his answer to the question as to what first enables a “distinction between thought and reality [*Scheidung von Gedachtem und Wirklichem*]” in perception—against the background of a century-old philosophical debate between the (strict) empiricist tradition and the tradition of transcendental idealism (Helmholtz 1878, 242). As will soon be clear, this historical framework provides an interesting interpretive tool in getting a firmer grasp of the systematic purport of Helmholtz's empirico-transcendentalism, specifically with regard to the problem of accounting for the differential awareness of self and world that is presupposed in every act of perception.

Although the main goal of this paper is thus systematic in nature, it is structured in accordance with the historical chronology of the authors discussed. First, an analysis is presented of the way in which Hume's inability properly to address issues

¹For Helmholtz's indebtedness to Kant's philosophy, see for example Krause (1878), Schwertschlager (1883), Goldschmidt (1898), Hatfield (1990), Cahan (1993), and Schiemann (2009). Also see De Kock (2014a, 2014b, 2016).

pertaining to the subject and self-consciousness created insurmountable problems with respect to the problem of differentiation in experience. As such, we will be dealing with what William James once identified as strict empiricism's “lurking bad conscience about the self” and the shyness “about openly tackling the problem of how it [the Self] comes to be aware of itself” (James 1890, 354). In doing so, the problem of subjectivity is not considered in its own right, but only to the extent that it is related to the problem of differentiation. Second, the works of Kant and Fichte will be reviewed (see Section 2) in light of their potential to provide an antidote to the pitfalls of Hume's strict empiricist framework in trying to found object experience. Subsequently, Mill's neo-Humean *Psychological Theory of the Belief in an External World* is outlined, as well as the way in which it reproduced the problems inherent to Hume's empiricism (Section 3). Finally, the systematic purport of Helmholtz's move beyond the strict empiricist framework and his subsequent alignment with the transcendental tradition with regard to the problem of differential consciousness are discussed in light of this historical framework (Section 4). In addition to exploring the possible enlightening effects of historicizing the peculiar entanglement of philosophical traditions in Helmholtz's account of differential consciousness, the analysis presented below also provides a good occasion to flesh out Helmholtz's intellectual relation to John Stuart Mill.² In contrast to Helmholtz's notoriously complex attitude towards Kant's philosophy, his indebtedness to Mill has often been taken for granted, but is rarely studied in detail. Furthermore, the analysis presented poignantly illustrates the epistemological and methodological discussions that came up in the development of a scientific program of psychology.

²Although Helmholtz indeed professed his indebtedness to Mill's *System of Logic* (see below), Boring (1950) and Hochberg (2007), for example, have gone as far as assimilating Helmholtz's and Mill's views on perception (see section 4). Most scholars, however, have a more moderate view on Helmholtz's indebtedness to Mill (e.g., Hatfield 1990; Schiemann 2009). That said, however, the secondary literature on the Helmholtz–Mill relation remains scarce.

2. Differential Consciousness: A Centuries-Old Debate

In his *The Facts of Perception*, Helmholtz defined the problem of differential consciousness as the question as to how we first come to make a “distinction between thought and reality [*Scheidung von Gedachtem und Wirklichem*]” (Helmholtz 1878, 242, 115–16). In trying to tackle this problem Helmholtz engaged with a long-standing philosophical issue. In the nineteenth century especially, debates on this matter intensified and made apparent the opposition between empiricism on the one hand, and nativism, intuitionism and transcendentalism on the other.³ First and foremost, the problem at stake brought about fierce discussions on the systematic place of the subject and self-consciousness in experience. While most approaches to the genesis of object consciousness implicitly or explicitly presuppose a self-conscious, unitary subject that founds the stability and identity of object-experience over time, not all philosophical frameworks can accommodate such a concept. Especially within strict associationist accounts of experience, the (lack of a) notion of the self has caused considerable theoretical difficulties. The major challenge for this particular tradition has been that of developing a workable notion of the subject, which does not in and by itself condemn any possible account of differentiation to circularity and infinite regress. The assimilation of self-consciousness to object-consciousness (in so-called “objectal” accounts of the subject) has proven to be particularly detrimental. Manfred Frank aptly analyzes the theoretical deadlock as follows:

³To be sure, the problematization of subject-object differentiation is contingent upon the denial that object-consciousness is directly given with mere sensation. In Helmholtz’s case, this denial was based upon (the epistemological consequences of) Müller’s *Law of Specific Nerve Energies* (*Gesetz der Spezifischen Sinnesenergien*), a physiological law that posits a fundamental incongruity between internal states of excitation and external objects and affairs (Müller 1833/40).

For naturalism, it is settled that if there is such a thing as subjectivity at all, it is to be found among the natural entities. Natural entities are however . . . objects; and discourse about anything objectal is a discourse *de re*. It thus seems self-evident that subjects form a particular class of objects. (Frank 2007, 153)

Evidently, however, any account that (i) relies on a notion of a unitary, self-conscious subject as the foundation of object-consciousness, and at the same time (ii) reduces the former to (a special kind of) the latter, presupposes what it aspires to explain and thus leaves the very possibility of objectification unaccounted for.

From a historical point of view, David Hume’s *Treatise of Human Nature* offers a most interesting case-study to illustrate the problem at hand. A brief summary of Hume’s struggle with the notion of the self and its relation to experience is therefore highly instructive within the scope of this analysis, all the more so because Mill’s neo-Humean psychology would reproduce exactly the same theoretical difficulties.

2.1. Hume’s Labyrinth

As is well-known, Hume liked to describe his philosophical project in terms of an attempt to “anatomize” the mind, i.e., an attempt to decompose mental phenomena into more primitive elements (impressions and ideas), and reconstruct their formative history in the mind by means of a minimal number of mental laws (see for example Hume 1740, 6; Hume 1739–40, 311). With the latter, Hume had in mind the laws of association, which, not unlike Newton’s laws of motion, would provide a sufficient explanation for the way in which our most fundamental beliefs about the world are generated from basic impressions (1739–40, 58). In that sense, Humean philosophy offers a prototypical example of what Hatfield calls *methodological naturalism* with regard to the mind, i.e., “the attempt to discover ‘natural’ laws of the mind, where ‘natural’ is cashed out through an analogy

with the methods and modes of explanation in natural science, instead of by an appeal to ontology” (Hatfield 1990, 17). First and foremost, methodological naturalism thus refers to a specific mode of psychological explanation that envisions an *a posteriori*, constructive account of mental phenomena, or, as Kant would have it, a physiology of understanding (CPR⁴ AIX). Interestingly, the stringent application of this methodology initially led Hume to develop genetic accounts of the notions of *thinghood* and of personal identity—or indeed, of object and self—that were fundamentally at odds with one another. As several authors have noted, his later retraction of the theory of personal identity (see below) might have indicated a certain awareness of this fundamental inconsistency, but it did not prevent the reception of his associationism by many as fundamentally flawed, not least because it failed miserably at accounting for the genesis of dual (differential) consciousness.

In the section “Of scepticism with regard to the senses”, Hume provided an outline of his answer to the question as to *What causes induce us to believe in the existence of body?* (Hume 1739–40, 238–68). After denying that this belief could be given, either directly through sensation or mediated by logical reasoning, he proceeded to outline his take on the imaginative (i.e., associative) origin of the belief in thinghood. More particularly, he argued that externally generated sensations, in contrast to internally generated ones, succeed one another in a *constant* and *coherent* manner and that by virtue of this qualitative difference, the former tend to be merged by imagination into the associative construct that we call a *thing* (1739–40, 249). Subsequently, Hume applied the same methodological strategy in analyzing the genesis of the notion of the self in the section “Of personal identity” (§I.4.iv). After having suspended the metaphysical question concerning the self-in-itself, Hume set out

to pinpoint the psychological origin of the belief in a self as a continued and distinct existence. In doing so, he resorted to a quasi-observational, introspective strategy in search of the basic sensible elements from which this belief might emerge. But in entering “most intimately into what I call myself,” he famously proclaimed, “I always stumble on some particular perception or other . . . I never can catch myself at any time” (1739–40, 300). From this, he finally concluded that the “mind is a kind of theatre, where several perceptions . . . make their appearance; pass, re-pass, glide away, and mingle.” This is the broad outline of Hume’s notorious ‘bundle theory’ of the self, i.e., his claim that what we call personal identity is “nothing but a bundle or collection of different perceptions” that refers to nothing but “a heap or collection of different perceptions . . . falsely . . . endow’d with a perfect simplicity and identity” (1739–40, 257).

In itself, Hume’s bundle theory was a systematic implementation of his methodological naturalism with regard to the problem of the origin of the notion of personal identity. Indeed, as Singer notes, he “might . . . have stopped at that point, congratulating himself on his explosion of a non-naturalistic notion of the self” (Singer 2000, 232). This is, however, not what happened; Hume retracted his bundle theory a year after publishing the *Treatise*, stating that he deemed his account to be “very defective” as it cannot account for “the principle of connection” that binds perceptions together (Hume 1739–40, 677). Furthermore, he desperately added that he found himself “involv’d in such a labyrinth,” neither knowing “how to correct” his former opinions, “nor how to render them consistent” (1739–40, 675). Not only did Hume *retract* his former theory, however, he simply threw in the proverbial towel and concluded: “For my part, I must plead the privilege of a sceptic, and confess that this difficulty is too hard for my understanding” (1739–40, 678). A host of Hume scholars have pointed to the possible detrimental effects of Hume’s *aporia* with regard to the self on

⁴Kant’s *Critique of Pure Reason* is abbreviated as CPR here and in what follows.

the soundness of his psychological project. Cassirer, for example, claimed that Hume's perplexity with regard to the subject meant nothing less than "the collapse of the sensualistic scheme of knowledge" as it left "the conceptual function by virtue of which sensations are united in a lawful unity . . . without justification and ground" (Cassirer 1922, 387). More recently, Roth, Stroud, Waxman, Singer, Strawson and Inukai, among others, likewise argue in one way or another, that the idea of the self as a bundle threatened the foundation of Hume's associationist psychology.⁵ Most generally, all of these criticisms unfold from a central paradox in Hume's system, namely that his associationism in general, and his account of thinghood in particular, (a) presupposes a *principle* of subjectivity, i.e., an active, unitary subject, that (b) cannot, however, be accounted for within the naturalistic framework itself. As Strawson aptly describes it in his excellent analysis of Hume's struggle with the problem of personal identity, Hume might have come to realize that "[h]is theory works explicitly with something that it officially holds to be unintelligible" (Strawson 2011, 134).

Within the scope of this paper, however, we are mainly interested in the problems Hume's bundle theory created with regard to the philosophical problem of differential consciousness. One of the peculiar implications of the bundle theory is

⁵While Waxman (1992, 235) argues that without a unifying principle Hume could not account for "the consciousness of perceptual succession . . . presupposed for the imagination to associate perceptions," Roth (2000) contends that Hume's bundle theory was highly problematic with regard to his theory of the object (see below). Stroud (2006, 344) in his turn argues that the principles of imagination are simply too meagre to account for the genesis of beliefs and thoughts, and that Hume, on account of his own methodology, can simply not assume that "there are such things as active, thinking human beings with experiences and thoughts". As will be explained below, Inukai (2007) takes issue with the "bundling problem", i.e., the problem that the possibility of association depends somehow upon the ordered manner in which impressions present themselves, prior to any associative activity.

that both the idea of personal identity and that of thinghood are derived from exactly the same series of impressions:

Hume characterized psychological forces in terms of association in the imagination which leads to running perceptions together and treating them as if they had an identity over time. Given such an understanding of the psychological forces at work, it is hard to see how one might derive from the very same succession of subjectively accessible perceptions on the one hand the idea of personal identity—a single self unified over time—and on the other hand a plurality of worldly objects. (Roth 2000, 113)

In other words, Hume's bundle theory gravely affected his psychology of the object, and could even be said to make it unintelligible. If he retained his bundle view, object and self would have to be constructed within the same series, without there being any means available to differentiate between the two. Hence, there would be no self, no object, no experience; only a chaotic universe of data with no subject to experience them. Hume's retraction, however, did not solve the problem, but rather concealed it (Waxman 1992; Lloyd 1993). The question remains: how can there be experience, without a subject that somehow relates to itself as the one experiencing, and therefore, without a subject in a position to differentiate between itself as experiencing and the things experienced? Lloyd aptly summarizes the problem as follows:

Even if Hume thought there were only one self in existence—although of course as a good sceptic he could not claim to know that—the problem which reduces him to dismay in the appendix would remain. His real problem lies in getting a workable distinction between the intellectual world . . . and that other world, supposedly there as independent object of knowledge. . . . In telling Humean stories of the origin of beliefs, we must presuppose . . . a unifying subject, as we might now say. And this is what Hume cannot presuppose. . . . [D]oes not the whole picture fall apart? (Lloyd 1993, 65–67)

2.2. Differentiation after Hume: Intuitionism, Kant and Fichte

The problems with Hume's associationist account of experience initially led to a philosophical regression to what Hume would have called the "vulgar standpoint". In the wake of his philosophical project, the common-sense movement arose in an attempt to circumvent the apparent absurdities to which the vigorous implementation of the naturalistic framework with regard to the study of mind seemed to lead. Thinkers such as Thomas Reid and Sir William Hamilton dissolved Hume's problems by founding differential consciousness in the "immediate testimony of consciousness". According to Reid, this is the only sound alternative to Hume's "metaphysically absurd" assumption "that sensation and thought may be without a thinking being" (Reid 1764, 108). "[C]onsciousness assures us that . . . we are immediately cognizant of an external and extended non-ego," Reid maintained (1764, 745). In sharp contrast to Hume, Reid considered the "belief in present existence" to be "the immediate effect of . . . constitution" (1764, 183). In the same vein, he held that the concept of the self was "suggested by our constitution", and was therefore not in need of empirical explanation (1764, 110). A similar approach was developed by Sir William Hamilton, a disciple, commentator and critic of Thomas Reid, who adopted the latter's intuitionism and argued that "we are immediately conscious in perception of an ego and a non-ego, known together, and known in contrast to each other." Although Hamilton was one of the most eminent philosophers of his time, one of the reasons he soon fell into historical oblivion was the devastating attack on his philosophical system presented in J. S. Mill's 1865 *An Examination of Sir William Hamilton's Philosophy*, which will be discussed in Section 3.⁶

⁶Hamilton's prominent position in the philosophical landscape of his time is attested, for example, in the works of J. S. Mill (1865/1878), Fraser (1865), and Stirling (1865).

A much more elegant position on the matter was developed by Kant and his successors. Through a series of articles and books, Patricia Kitcher presents a compelling body of evidence in favor of the hypotheses that (i) Kant was well aware of Hume's problems with personal identity when he wrote the *CPR*, and that hence, (ii) some passages in the latter work—most importantly the Deduction (A84–130/B116–69)—were written explicitly as an attempt to overcome them.⁷ According to Kant, Hume's bundle theory was not so much wrong, as it was trivial. It is true, he claimed, that what we find through "inner sense" (or "empirical apperception") is "forever variable; it can provide no standing or abiding self in this stream of inner appearances" (*CPR* A107). But then again, he added:

That which should necessarily be represented as numerically identical cannot be thought of as such through empirical data. There must be a condition that precedes all experience and makes the latter itself possible. (*CPR* A107; see also Kitcher 1990, 102)

"[T]his original and transcendental condition," according to Kant, "is nothing other than the transcendental apperception", i.e., the *I think*, defined as the necessary, *a priori* "unity of consciousness that precedes all data of the intuitions, and in relation to which all representation of objects is alone possible" (*CPR* A107). Only under this transcendental condition, Kant argued, is the concept of an object intelligible, as "the original and necessary consciousness of the identity of oneself is at the same time a consciousness of an equally necessary unity of the synthesis of all appearances" (*CPR* A108).⁸ The shift from a nat-

⁷This hypothesis contradicts Kemp Smith's (1923/1962), who maintained that Kant had no knowledge of Hume's problem. While there is no way of determining whether Kant had actually read Hume on this topic, Kitcher points to the mediating influence of for example Beattie and Tetens, two figures whom Kant did read, and who addressed the problem extensively in their works. For an overview of Kitcher's arguments in this respect, see Kitcher (1982, 43–44; 1990, 98–100; 2011, 31–32).

⁸The *I think* guarantees that a manifold "is united in one consciousness,"

uralized (*quid facti*) to a normative (*quid juris*) investigation not only allowed Kant to diagnose Hume's *aporia*, it likewise enabled him to found experience and the possibility of differential consciousness in the formal unity of the epistemic subject, thereby sidestepping circularity issues.

To conclude this historical introduction, a consideration of Johann Gottlieb Fichte's further elaboration of the Kantian principle of apperception is worthwhile, mainly because, as I have argued elsewhere, the basic rationale of his approach to the matter reappears in Helmholtz's work.⁹ The most primitive fact to be explained by transcendental philosophy, according to Fichte, is that of how "I make a distinction within myself between a knowing subject and a real force [*reelle Kraft*], which, as such, does not know, but is" (Fichte 1798, 10–11). In addressing the question as to "How do I come to make this distinction?" Fichte first and foremost attended to the grammatical subject of Kant's *I think*, wondering "Which 'I' is being spoken of here?" (Fichte 1794/1797–98, 48, 50–51; *CPR* B132).¹⁰ As such, Fichte's philosophical system was permeated by the conviction that the critical analysis of experience is not sufficiently founded unless one can account for the precise nature and structure of the tran-

and it is only by virtue of this self-referential structure that an object can "become an object for me," i.e., it is the "condition under which alone I can ascribe them to the identical self as my representations, and thus can grasp them together." Compare *CPR* (B132; boldface in original):

The **I think** must be able to accompany all my representations; for otherwise something would be represented in me that could not be thought at all, which is as much as to say that the representation would either be impossible or else at least would be nothing for me. . . . Thus all manifold of intuition has a necessary relation to the **I think** in the same subject in which this manifold is to be encountered. But this representation is an act of **spontaneity**, i.e., cannot be regarded as belonging to sensibility. I call it **pure apperception**, in order to distinguish it from the empirical one.

⁹For a detailed discussion see De Kock (2014a, 2014b).

¹⁰For Fichte's view on the fundamental incompleteness of Kant's system, also see Fichte (1796/99, 80).

scendental subject of knowledge, i.e., Kant's so-called subject = *x*.¹¹ Hence, Fichte aimed to determine the conditions of possibility for, and modalities of, the necessary self-reflexivity that accompanies all acts of representation. In doing so, he famously analyzed the ideal structure of the I in terms of self-positing activity:

I find myself to be acting efficaciously in the world of sense. All consciousness arises from this discovery. Without this consciousness of my own efficacy [*Wirksamkeit*], there is no self-consciousness; without self-consciousness, there is no consciousness of something else that is not supposed to be I myself. (Fichte 1798, 5)

Fichte thus conceptualized the necessary self-reflexivity of the I in terms of a primordial sense of agency, given through so-called "intellectual intuition", i.e., "the immediate consciousness that I act . . . : it is that whereby I know something because I do it" (Fichte 1794/1797–98, 38).¹² In Fichte's theorizing, the grammatical subject of Kant's *I think* is thus determined in terms of practical subjectivity, i.e., as a self-determining, volitional being. As such, Fichte's elaboration of Kant's critical analysis amounted to

¹¹See for example *CPR* (B404; emphasis added):

Through this I, or He, or It (the thing), which thinks, nothing further is represented than a *transcendental subject of thoughts* = *x*, which is recognized only through the thoughts that are its predicates, and about which, in abstraction, we can never have even the least concept; . . . we cannot separate ourselves from this inconvenience, because the consciousness in itself is not even a *representation*.

¹²It should be noted that Kant explicitly rejected the notion of intellectual intuition as a mystic *Unding*, i.e., as nonsense. See for example Kant (1821, 425):

[I]ntellectual intuition . . . , i.e., the possibility that purely intellectual *a priori* concepts . . . rest on immediate intuition of the understanding; This mystical hypothesis thus assumed that the understanding could operate like the senses, having pure intuitions . . . ; however the faculty of intuition, which rather applies to the senses alone, cannot be attributed to the understanding . . .

a *system of knowledge* in which “philosophy is pushed out of the theoretical field . . . over into the practical” (Fichte 1794/1797–98, 61).¹³ Through this shift from the *I think* to the *I will* in Fichte’s system, the differential structure of consciousness is analyzed in terms of a dynamical, reciprocal determination of the I and the Not-I, related to one another as activity and resistance. The object thus appears first and foremost in its capacity of a *Gegenstand*, i.e., in its being-for-us as resistance and limit, that is to be thought against the background of a knowingly agentive being.¹⁴ As a consequence, Fichte maintained that freedom is not just a practical law (*praktisches Gesetz*), but moreover “a theoretical principle [*theoretisches Princip*]” for the determination of our world (*Weltbestimmung*) (Fichte 1798, 70).

3. Back into the Labyrinth: Mill’s Account

In his voluminous *An Examination of Sir William Hamilton’s Philosophy* (1865/1878), Mill discussed what he considered one of the most central questions of the philosophy of consciousness, i.e., the “distinction between myself—the Ego—and a

¹³Or as Fichte captured it in his *Vocation of Man* (1800, 131):

[I]t is . . . our own real activity and . . . the definite laws of human action which lies at the root of all our consciousness of a reality external to ourselves . . . From this necessity of action proceeds the consciousness of the actual world; and not the reverse way . . . We do not act because we know, but we know because we are called upon to act: the practical reason is the root of all reason.

¹⁴See for example Fichte (1794/1797–98, 228–29):

Insofar . . . as an object [*Gegenstand*] is to be posited, and as a condition of the possibility for such positing, there must be another activity [*Tätigkeit*] (= X) occurring in the self, distinct from that positing. . . . The object is merely posited, insofar as there is resistance [*Widerstand*] to an activity of the self; no such activity, no object. It is related as determinant [*Bestimmende*] to determinate [*Bestimmten*]. Only insofar as this activity is resisted, can an object be posited; and so far as it is not resisted, there is no object.

world . . . external to me” (Mill 1865/1878, 6; 1843/1882, 579–659). Through his analysis, Mill (i) aimed at demonstrating that questions pertaining to the human mind can be dealt with conclusively by means of a strict empiricist methodology, thus (ii) providing an argument in favor of the hegemony of empiricism in the newly emerging field of scientific psychology. As such, Mill’s involvement with the problem of differential consciousness can be considered as an implementation of his program for a science of man, for which he laid the foundation in *On the Logic of Moral Sciences*, the sixth book of his *A System of Logic* (1843/1882). Similar to Hume’s analysis, Mill envisioned a genetic study of mental phenomena, which takes as its point of departure invariable laws that “have been ascertained by the ordinary methods of experimental inquiry,” i.e., the laws of association (Mill 1843/1882, 490; also see 1865/1878, 14). In the *Examination*, Mill accordingly introduced his *Psychological Theory of the Belief in an External World* as an attempt to show that . . .

. . . there are associations naturally and even necessarily generated by the order of our sensations and of our reminiscences of sensation, which, supposing no intuition of an external world to have existed in consciousness, would inevitably generate the belief, and would cause it to be regarded as an intuition. (Mill 1865/1878, 227)

According to Mill, only two general presuppositions are needed for this associationist approach to the genesis of the notion of thinghood, namely (1) the presumption that “the human mind is capable of expectation,” i.e., that it can conceive of future possibilities, and (2) the laws of association (1865/1878, 225). Based on these two postulates, Mill argued, it is theoretically possible to account for the idea of the object in terms of a psychological construct produced through the association of sensations (Mill 1865/1878, 7). More specifically, he hypothesized that the notion of the *object* as an independent existence derives from the empirically formed notion of *possible* sensations: if we state that consciousness contains a belief in the Not-I, this means that

apart from the flow of actual sensations, we acknowledge the permanent possibility of sensation as a conditional certainty:

[T]he very idea of anything out of ourselves is derived solely from the knowledge experience gives us of the Permanent Possibilities. Our sensations we carry with us wherever we go, and they never exist where we are not; but when we change our place we do not carry away with us the Permanent Possibilities of Sensation: they remain until we return, or arise and cease under conditions with which our presence in general has nothing to do. (Mill 1865/1878, 229, 238)

Once the idea of the object has been formed, experientially derived knowledge about possible sensations guide future experience in a top-down manner, i.e., as inductive hypotheses about the lawlike covariation between our movements and certain aggregates of sensations. To illustrate his approach, Mill offered the following example:

I see a piece of white paper on a table. I go into another room. . . . [T]hough I have ceased to see it, I am persuaded that the paper is still there. I no longer have the sensations which it gave me; but I believe that when I again place myself in the circumstances in which I had those sensations, that is, when I go again into the room, I shall again have them; and further, that there has been no intervening moment at which this would not have been the case. . . . *The conception I form of the world existing at any moment, comprises, along with the sensations I am feeling, a countless variety of possibilities of sensation.* (Mill 1865/1878, 228; emphasis added)

To account for the intuitive nature with which the belief in a Not-I emerges in consciousness, Mill introduced the *principle of obliviscence* that states that the associative chain from which the idea of an object is generated, tends to “drop out of consciousness.”¹⁵ As the process of associative construction is pushed back

¹⁵Mill (1865/1878, 323) explained the principle as follows: “[W]hen a number of ideas suggest one another by association with such certainty and rapidity as to coalesce together in a group, those members of the group which

to the unconscious level, Mill proceeded, “we see, and cannot help seeing, what we have learned to infer” (1865/1878, 227).

A striking feature of Mill’s psychological analysis, however, is the way in which it reproduced the problems associated with Hume’s Labyrinth (see Section 2.1). As Mill’s empiricist framework allowed only for knowledge that is given by, or inferred from sensible data, he was simply unable to account for the subject presupposed by his theory. Indeed, as Alan Ryan notes, “Mill’s philosophy required an active mind which would construct an external world out of sensations. . . and yet he had no way of accounting for the existence of such an active intelligence” (Ryan 1974, 226). To be sure, Mill attended to the problem of the self in a surprisingly short and quite puzzling chapter of his *Investigation* entitled “The psychological Theory of the belief in matter, how far applicable to mind.” In this chapter, Mill pondered the question of “whether, at the first moment of our experience, we already have in our consciousness the conception of Self as a permanent existence; or whether it is formed subsequently, and admits of a similar analysis” (Mill 1865/1878, 240). In addressing the issue, Mill’s reasoning went as follows. If the belief in external existence allows for an analysis in terms of the permanent possibility of sensation, then the mind (or internal existence) can be equated with something like *a permanent possibility of feeling*, i.e., an imaginative compound of the flux of feelings presently experienced, and those to be experienced in the future. However, as Mill correctly observed, this account would be entirely circular, as the very idea of permanent possibilities is founded in the hypothesized capability of expectation, and as such, the theory would presuppose the very thing it aims to demonstrate. Mill acknowledged that the self, according to this rationale, would thus have to be “a series of feeling. . . aware of itself as a series” (1865/1878, 248). After dwelling a bit more

remain long without being specially attended to, have a tendency to drop out of consciousness.”

on the topic, he concluded that the self simply does not allow for psychological analysis:

The truth is, that we are here face to face with that final inexplicability . . . [O]ne mode of stating it only appears more incomprehensible than another . . . I think, by far the wisest thing we can do, is to accept the inexplicable fact, without any theory of how it takes place. (Mill 1865/1878, 262)

The feeling of *déjà vu* grows when we consider the appendix added in the 1878 version of the *Examination*, in which Mill acknowledged that “in so far as reference to an Ego is implied in Expectation, I do postulate an Ego” (1865/1878, 258). At this point in time, Mill granted that the ability to anticipate (as is implied by the concept of expectation) presupposes a subject that is somehow aware of itself as a unity in time, referring past and future experiences to itself, while maintaining its numerical identity. The Ego, he therefore stated in the appendix, is “the inexplicable tie, or law . . . which connects the present consciousness with the past one . . .,” which “is as real as the sensations themselves, and not a mere product of the laws of thought” (1865/1878, 262).

Not surprisingly, it did not take long for Mill’s failure to account adequately for the subject presupposed in his associationism to be criticized. William James noted that Mill “makes the same blunder as Hume” and considered it to be symptomatic for “the definitive bankruptcy of the associationist description of the consciousness of self” (James 1890, 358–59). Alan Ryan, in his turn, claims that Mill’s failure to account for the foundation of his associationist psychology meant nothing less than a “disaster for his whole philosophical system,” as “the metaphysics to which Mill was committed had a contradiction at its heart” (Ryan 1974, 226). Andy Hamilton contends that Mill’s “final inexplicability” “echoes Hume’s confession of failure in his own Appendix to the *Treatise*, even if the tone appears unduly complacent rather than troubled,” adding that “both writers,

perhaps, suspect that a yawning chasm is opening up around their philosophical viewpoint, and would prefer not to peer into it” (Hamilton 1998, 165). To summarize, the “yawning chasm” in question pertains to the way in which both Hume’s and Mill’s perplexity with regard to the question of the subject threatened the intelligibility of associationism in general, and that of differential consciousness in particular. As will be explored in what follows, this historical empiricist deadlock may well be considered a systematic motive for Helmholtz’s shift towards a transcendently inspired approach in his treatment of differential consciousness. In contrast to existing analyses, however, the emphasis in this respect will not be so much on Helmholtz’s peculiar appropriation of Kant’s *a priori* view of causality, but rather on the way in which he determined the principle of free will and the possibility of autonomous action as a precondition of the possibility for experience. Doing so will not only present an excellent occasion to further flesh out the details of Helmholtz’s intellectual relation to Mill, it inevitably leads us to briefly consider Helmholtz’s way of appropriating Fichtean insights in his theory of perception.

4. Hermann von Helmholtz’s Hovering Between Empiricism and Transcendentalism

Although the vast amount of literature on Helmholtz’s complex epistemological position prevents any one-sided interpretation, there is indeed sufficient textual evidence to support the hypothesis of a direct influence of J. S. Mill on Helmholtz’s theory of perception as unconscious inference, as several authors noted (see note 2). Furthermore, there are some more general parallels between both authors in their general conception of a program of a science of man. Both fiercely advocated methodological naturalism with regard to the mind and rejected physicalism

or what Mill called “biologized psychology” (1843/1882, 592).¹⁶ While Helmholtz famously defined his empiricism in opposition to nativism, Mill put forward his philosophical project as an alternative to what he called the *a priori* school of philosophy, a term that covered both (common-sense) intuitionism and (post-Kantian) idealism in his thought.¹⁷ Interestingly, the

¹⁶Mill’s science of man was once credited by F. Albert Lange as an attempt to “assert the rights of psychology,” “against the strictly materialistic view” (Lange 1881, 189). Mill’s non-reductionist stance is illustrated for example by the following passage taken from his *A System of Logic* (1843/1882, 590–91):

Whether . . . mental states are . . . dependent on physical conditions, is one of the vexatae questiones in the science of human nature. . . . Many eminent physiologists hold the affirmative. These contend . . . that some particular state of our nervous system, . . . in particular . . . the brain, invariably precedes, and is presupposed by, every state of our consciousness. According to this theory, one state of mind is never really produced by another: all are produced by states of the body. . . . [T]hat every mental state has a nervous state for its immediate antecedent and proximate cause, . . . can not . . . be said to be proved, . . . and even were it certain, yet everyone must admit that we are wholly ignorant of the characteristics of these nervous states. . . . [T]he successions therefore, which obtain among mental phenomena, do not admit of being deduced from the physiological laws of our nervous organization. . . . [T]herefore . . . there is a distinct and separate Science of Mind.

¹⁷It is important to note that Mill’s conception of “the *a priori* school” was very (even excessively) broad, and targeted not only German Idealism, but likewise all forms of nativism and intuitionism with regard to mental contents. From this perspective, Mill put Hamilton’s intuitionism on a par not only with Reid, but also with Kant, stating that “the test by which they all decide a belief to be a part of our primitive consciousness—an original intuition of the mind—is the necessity of thinking it” (Mill 1865/1878, 142). One could obviously contend that this allegation implies an unwarranted identification of (radically different) schools of thought. While this criticism would be completely justified—it suffices to point out the immense difference between (i) common sense’s introspective method and Kant’s transcendental regression, and (ii) genetic versus transcendental apriorism, for example—and while Mill could indeed have been somewhat more refined in the identification of his enemy, it is unlikely that this would have had any effect on his disapproval of both. The “conflation” at work here seems to be no more than a part of

details of Mill’s and Helmholtz’s psychological accounts of the genesis of external experience also resonate in important ways. It is therefore no wonder that authors such as Boring (1950, 304) have argued that Helmholtz “belongs . . . systematically more with British thought than with German, in the tradition of John Locke down to the Mills” and that Hochberg (2007, 331) even went as far as completely assimilating Helmholtz’s psychological analysis to Mill’s in talking of “Helmholtz-Mill” theories of perception.

To a certain extent Helmholtz’s psychology of the object can indeed be interpreted as a continuation of the empiricist tradition, insofar as he (i) conceives of the perceptual object as a complex—as opposed to a simple, intuitive, unanalyzable—mental phenomenon, which can hence be (ii) decomposed into more basic elements (sign-sensations) and (iii) reconstructed according to general mental laws. Similar to the process of language acquisition and comprehension, Helmholtz famously argued, sensations are first and foremost “signs [*Zeichen*] which we have learned to decipher” through the repeated experience of a lawlike covariation between voluntary movement and the coming into being of certain sensations (Helmholtz 1869, 222).¹⁸

a rhetorical strategy to put forward his own empiricist philosophy, which is intended to challenge common sense as well as Kantianism, although it can be argued that the challenge faced is not the same with respect to both schools.

¹⁸Also see Helmholtz (1894, 250):

An instructive example is the comprehension of our native language. This knowledge is not inborn; . . . we have acquired our mother tongue by learning, that is, by usage through frequently repeated experience. . . . The child hears the usual name of an object pronounced again and again when it is shown or given to him, and constantly hears the same change in the visible environment described with the same word. Thus the word becomes attached to the thing in his memory . . . [A]t the beginning we still remember the individual cases where we have heard it used. Later . . . we are no longer able to recount under what particular circumstances we came to this knowledge . . .

For Helmholtz’s sign-theory of perception, also see Helmholtz (1868, 1869, 1878).

The way in which this general approach resonates with Mill's becomes very tangible in the following quotation:

Let us call the entire group of aggregate sensations induced . . . by a certain definite and finite group of the will's impulses the 'current presentables' [*Präsentabilien*]; by contrast, let us call 'present' [*präsent*] the aggregate of sensations from this group which is just coming to perception. Our observer . . . can make each individual presentable present to himself at any moment through execution of the relevant movement. In this way it seems to him that each individual from this group of presentables exists at each moment during this period of time. . . . Thus the idea of a simultaneous and continuous existence of different things alongside one another will be achieved. (Helmholtz 1878, 350)

At first sight at least, this approach is strikingly similar to Mill's, as it puts forward a genetic account of the notion of thinghood in terms of an associative compound of expected sensory changes ("presentables"). Once learned, these experientially constructed laws or conditional certainties come to function as major premises in the inductive process that Helmholtz hypothesized to be at the basis of perception. The most general rule underlying the perceptual process, Helmholtz therefore claimed, is that "such objects are always imagined as being present . . . as *would have to be there* in order to produce the same impression on the nervous mechanism" (Helmholtz 1856–66, III, 2, emphasis added). Not unlike Mill, Helmholtz thus claimed that the notion of the object is a generative hypothesis pertaining to expected contingencies that is projected onto the visual field and as such, gives rise to the experience of a world *out there*. This, in short, is the basis of Helmholtz's theory of perception as unconscious inference, or his "projection theory" of perception: it is the unconscious application of a general law (the major premise) to a particular sensible event.¹⁹ In both the first and

¹⁹This specifically projectivist understanding of objectification in perception was anticipated in Hume's account of ideas (like that of causality, or the notion

the second, revised, version of his *Treatise on Physiological Optics* (*Handbuch der physiologischen Optik*), Helmholtz credited Mill with giving the best explanation of the nature of inductive conclusions (*Inductiven Schlüsse*), especially regarding the empirical and hence provisional nature of the major premise (1856–66, III, 447, 1896, III, 581). In the same vein as Mill had argued in the section *Of Analogy* of his *A System of Logic*, Helmholtz claimed that the particular inductions at work in the perceptual process are based upon the analogy of the present case (or current sensations) with previously constructed inductive generalizations (1856–66, III, 447).²⁰ In contrast to *perfect* or *complete* induction, this analogical form of reasoning is fallible in nature, and while varying degrees of probability are possible, the correctness of these inductive hypotheses has to be tested in every particular case at hand.²¹ Finally, it is worth noting that both Helmholtz and Mill used the same strategy in accounting for the apparent immediacy of object-consciousness, namely by appealing to a process of *unconscious* learning (1856–66, III, 32).

Despite the similarities between Helmholtz and Mill with respect to their conception of a science of man in general and their account of object-consciousness in particular, they disagreed on some central issues. In addition to the well-known differences

of existence) as products of the mind's "propensity to spread itself on external objects". See Hume (1739–40, 217).

²⁰Helmholtz (1856–66, III, 26) gives the following example:

When those nervous mechanisms whose terminals lie on the right-hand portions of the retinas of the two eyes have been stimulated, our usual experience, repeated a million times all through life, has been that a luminous object was over there in front of us on our left. We had to lift the hand toward the left to hide the light or to grasp the luminous object; or we had to move toward the left to get closer to it. Thus while in these cases no particular conscious conclusion may be present, yet the essential and original office of such a conclusion has been performed . . . simply . . . by the unconscious processes of association of ideas . . .

²¹See Mill (1843/1882, 394). For Helmholtz's appropriation of Mill's views on induction, also see Hatfield (1990, 200).

between both in their appreciation of (post-)Kantian idealism—Mill’s anti-idealism contrasted sharply with Helmholtz’s self-professed indebtedness to transcendental philosophy—their views diverged with respect to the question of whether the scientific character of psychology is determined by a commitment to causal determinism.²² Mill left no doubt that he indeed considered the latter to be a *conditio sine qua non* for a science of man, and therefore assumed that “the law of causality applies in the same strict sense to human actions as to other phenomena”. “To assume the contrary—i.e., to assume that the will is not determined, like other phenomena, by antecedents, but determines itself” he added, would be “fatal to the attempt to treat human conduct as a subject of science” (Mill 1843/1882, 581).²³ Helmholtz’s psychological analysis, on the other hand, proceeded from the assumption that “agents act out of free will and are furthermore conscious of this freedom” (Heidelberger 1994, 171). In sharp contrast to Mill, Helmholtz thus denied that the perceptual process can be fully accounted for in terms of the “mechanically acquired association of ideas” (Helmholtz

²²See for example Mill (1843/1882, 579): “Principles of evidence and theories of method are not be constructed *a priori*. The laws of our rational faculty, like those of every other natural agency, are only learned by seeing the agent at work.” Mill’s criticism against *a priori* psychology can also be found in Mill (1859, 97–152).

²³We should add that this application of the law of causality to human volition, in Mill’s work, does not eliminate the feeling of moral freedom itself. Rather than defending determinism, Mill argues for compatibilism in the introduction to the sixth volume of his *A System of Logic*. A complete discussion of Mill’s theory of free will falls, however, outside of the scope of this discussion. What is relevant to us here, is that Mill’s argument for the universal applicability of the law of causality to human action contradicts Helmholtz’s insistence on the autonomous and unconditioned nature of the will’s impulse. This interpretation contradicts Steege (2012, 167–70), who puts Helmholtz and Mill on a par with regard to the question of free will. However, I believe this interpretation is based on an insufficient appreciation of the constitutive role of the will’s impulse in Helmholtz’s thought, as laid down particularly in Helmholtz (1878, 1892).

1855, 114–15, my translation). It is true, he argued, that “we have learned to link certain representations to certain sensations,” but this does not explain how we first arrive at a “distinction between thought and reality [*Scheidung von Gedachtem und Wirklichem*]” (1878, 242). To account for the latter, Helmholtz introduced the principle of free will and the derivative idea of autonomous action determination as foundational explanatory principles in his psychology. In what follows, Mill’s and Helmholtz’s respective positions on freedom and self-determination as explanatory principles in psychological science will therefore be explored. In doing so, we are exclusively interested in the differences between both authors regarding the explanatory role of autonomous action determination in analyzing mental phenomena. As such, questions regarding the relation of both authors’ epistemology to their ethical views, the relation of the concepts of freedom and liberty, the problem of compatibilism, and so on, are suspended. Rather, we are interested exclusively in the possible epistemic role of freedom within Mill’s and Helmholtz’s psychology, and more particularly, in the way in which Helmholtz’s qualification of the epistemic subject as a knowingly free agent can be read as an attempt to circumvent the problems encountered by Hume and Mill as sketched above.

4.1. Founding the Self: Freedom and Self-Determination

The difference between Helmholtz and Mill in their reception of German Idealism was maybe most salient in their interpretation of the causal law. While Mill was committed to the classical empiricist regularity view of causality (Mill 1843/1882), Helmholtz maintained that the “causal law is really an *a priori* given, transcendental law” and professed his indebtedness to Kant in this respect on several occasions (e.g., Helmholtz 1878, 363).²⁴ Helmholtz’s peculiar appropriation of Kant’s *apriorism*

²⁴In determining the causal law as an *a priori*, regulative law of thought, Helmholtz (1856–66, III, 453) furthermore explicitly juxtaposed his view to

is a much-debated topic in the secondary literature, as is its systematic place in Helmholtz's epistemology.²⁵ However, the causal law also had a pivotal role in Helmholtz's psychology of perception. Helmholtz established the law as a precondition for perceptual objectification, since unless one presupposes "the presence of external objects as the cause of nervous excitation, because there can be no effect without a cause", a subject would never escape the state of mere nervous excitation (Helmholtz 1855, 116, my translation).²⁶ Although the causal law could thus be said to provide a transcendental motive, so to speak, for the externalization of subjective sensations, it does not, however, account for the genesis of the idea of an external object as such. In Helmholtz's psychological analysis, the latter originates through a negative operation, i.e., through the negation of the will's impulse (*Willensimpuls*). In this respect, it is helpful to take another

that of J. S. Mill:

The law of causation, . . . has to be considered . . . as being a law of our thinking which is prior to all experience. . . . The law of causation was supposed to be a law of nature arrived at by induction. Recently it has been again interpreted in that way by J. S. Mill. . . . As opposed to that view, I shall merely say, . . . that there is a good reason to think that the empirical proof of the law is extremely doubtful.

²⁵Riehl (1904) and Schiemann (2009), for example, argue that Helmholtz's mature view of causality is on a par with empiricists such as Mill and/or Hume. Alternatively, Heimann (1974), Fullinwider (1990) and Hatfield (1990) maintain that Helmholtz's view of causality remained Kantian in spirit, while Turner (1977) suggests that Helmholtz aligned more with Fichte on this point.

²⁶It is interesting to note that in 1869 (115) the neo-Kantian Otto Liebmann put forward a similar account of the theoretical relation between perceptual objectification and causal understanding. In order to explain the capacity for objectification, the latter stated, we should presume that . . .

Human understanding is always, independently of the empirical circumstances, convinced, that it is possible to formulate a satisfying answer to the question 'Where is this coming from?' . . . Therefore, the category of causality is the *a priori* form of understanding. And it is . . . the condition of possibility of every possible perception, and therefore, of experience.

look at Helmholtz's argumentation in favor of his *a priori* view of causality. In pondering the source of this law, Helmholtz denied that it is derived from experience, as it is the very condition of externalization. And he goes on:

Can we get it from the internal experience of our self-consciousness? No; since we conceive of self-conscious acts of volition and thought as free; i.e., we deny that they are the necessary effects of sufficient causes. As such, the investigation into sense perception amounts to the insight already delivered by Kant: that the proposition "no effect without a cause" is a law of thought, given before every experience. (Helmholtz 1855, 116, my translation)

In this passage, Helmholtz thus argues for the *aprioricity* of the causal law, based on (a) its status as a condition, not an effect, of outer experience, and (b) a seemingly self-evident affirmation of the spontaneous, self-determined nature of inner experience. Note how these presuppositions install a radical discontinuity between internal and external experience, that is furthermore said to supervene upon the juxtaposition of their hypothesized respective regulative principles, namely *volition* or *self-determination* versus *causal determination*. Indeed, Helmholtz claimed, "[w]e assume . . . a principle of free will, for which we claim . . . a complete independence from the stern law of causality. . . . The case of conduct [*handeln*], that is best . . . known to us, we consider as an exception to the law" (Helmholtz 1856–66, III, 454; my translation). Accordingly, Helmholtz maintained that the will's impulse "has neither already been influenced by physical causes, which simultaneously determine the physical process, nor itself psychically influenced the succeeding perceptions" (1878, 358–59). Hence, the processes assumed to regulate human behavior in Helmholtz's psychology are dissociated from those that govern the physical and physiological realm, and considered instead as emerging from an act of will (*Willensact*), conceived of as a spontaneous "mental act [*psychischer Act*]" (1878, 359; 1896, 594). Helmholtz's emphasis on the autonomy

of the will's impulse thus correlated with a non-reductionism of the kind also put forward in Mill's plea against "biologized psychology". However, whereas Mill's non-reductionism derived from a negative argument—i.e., the lack of evidence that would support a sufficiently warranted derivation of mental laws from physical/physiological ones—Helmholtz's was at least in part based upon the assumption of a generic difference between the central explanatory principles of human behavior and natural phenomena, i.e., freedom versus causal determinism. Contrary to Mill, he therefore concluded that "in ascribing to ourselves free-will, we deny *in toto* the possibility of referring at least one of the ways in which our mental activity expresses itself to a rigorous law" (1862, 85). More importantly, however, Helmholtz assigned a pivotal role to autonomous action determination in his account of the problem we have centralized in this analysis, namely the problem of differential consciousness. That is, he accounted for the genesis of the object as a negation of the will's impulse, i.e., as the experience of a "power equivalent to our will, . . . a power opposing us [*uns entgegentretende Macht*]" (1878, 361). This is where Helmholtz's theorizing started to resonate with Fichte, who had once characterized the Not-I as a "the negation of activity; that is, . . . as 'being' [Sein], which is the concept of cancelled activity" (Fichte 1796/99, 67; emphasis added), thereby redefining perceptual experience as an *encounter* as Hyppolite (1959) noted, i.e., as a reciprocal determination [*Wechselbestimmung*] of activity and resistance. Indeed, as Westheimer (2008, 7) put it, in Helmholtz's theorizing "reality is what remains invariant when the expected changes due to willed movements are factored out from the sensory impressions." However, as was the case in Fichte's philosophy, this kind of dynamics would require a direct awareness of self-determined action on the part of the subject.

4.2. Agency and *Inner Intuition*

"Efforts . . . to establish belief in external reality," Helmholtz indeed maintained "must remain unsuccessful so long as they proceed only from passive observation" (Helmholtz 1892, 359). Given the crucial role of the experiment in the constitution of experience in Helmholtz's thought, Heidelberger (1993) was right in stating it seemed to fulfill the role of an *ars inveniendi*, rather than an *ars demonstrandi*. From what has been said thus far, it should be clear that the crucial operative principle in the experiment, according to Helmholtz, is not so much the physical movement itself but rather the experience of the contrast between self-determined alterations within the visual field and the negation thereof, or as one might say, between will and resistance. Accordingly, Helmholtz explained:

[H]uman actions, . . . posited by the will, form an indispensable part of our sources of knowledge. We have seen that our sense impressions are only a sign language . . . We humans must first learn to understand this sign system, and that happens when we . . . learn to distinguish which changes in our sense impressions follow from our acts of will, and which others enter independently of will. (Helmholtz 1892, 410)

Or as Helmholtz put it elsewhere: it is only through experimentation that we come to discover a world "independent of our will and imagination, that is, an external cause of our sensations" (1856–66, 31–32).

As already mentioned, this dynamic presupposes a direct awareness of self-determined action, that Helmholtz ascribed to *inner intuition* [*innere Anschauung*]. "In the experiment," Helmholtz specified, "the causal chain runs throughout our self-consciousness." The possibility of making sense of this "chain" in terms of external events depends on the fact that "we know one member of these causes—our will's impulse—from inner intuition, and know the motive by which it has occurred" (Helmholtz 1878, 358). To this he added that "[t]he

impulse to movement, is something directly perceivable. We feel *that* we do something . . . we do not know directly *what* we do”, i.e., the internal act of will is felt before its physical consequences (1878, 348, emphasis added). In the second, revised edition of his *Handbuch*, Helmholtz defined inner intuition as that by means of which “we observe [*Wahrnehmen*] processes in our mental life [*Seelenleben*]”, and points to the radical difference with outer intuition, i.e., “perceptions of external objects” (1896, 577).

While Helmholtz’s distinction between inner and outer intuition contains a superficial gesture towards Kant’s critical system, his theorizing by far exceeds the Kantian framework. Most notably, Helmholtz uses an immediacy criterion to distinguish between both. While “inner intuition” guarantees that the will’s impulse is “directly perceivable”, the possibility of outer intuition is said to be contingent upon the self-reflexivity of voluntary action. In this context, it is interesting to note that Helmholtz came quite close to rearticulating Kant’s apriorism with regard to space in terms of the will’s impulse. To the extent that the problem of differential consciousness can be reformulated in terms of a geometrical opposition between the spatial, and the non-spatial world, Helmholtz affirmed . . .

. . . space would be a . . . form of intuition prior to all experience insofar as its perception would be tied to the possibility of the will’s motoric impulses, and for which the mental and corporeal ability must be given us through our organization before we can have spatial intuition. (Helmholtz 1878, 349)

At first sight at least, Helmholtz’s strong emphasis on the logical and psychological primacy of the will’s impulse allowed him to sidestep some of the main problems faced by the empiricists discussed in the previous sections. For one thing, by presupposing a generic difference between (agentive) self-consciousness and object-consciousness, and by turning the former into a (psycho-)logical condition of the latter, Helmholtz avoided the

problem of infinite regress in accounting for the genesis of self-world differentiation. In the same vein, Helmholtz’s account did not face the difficulty of having to derive both the I and the Not-I from a homogeneous series of sensations. By positing a direct, “intuitive”, awareness of the will’s impulse a heterogeneity is introduced in the flux of sensations:

Those changes which [we] can bring forth and annul by conscious impulses of the will are to be distinguished from those which are not consequences of the will’s impulses and cannot be overcome by such. The latter finding is negative. Fichte’s appropriate expression for it is that a Non-Ego forces recognition of itself vis-à-vis the Ego. (Helmholtz 1878, 351)

Helmholtz’s reference to Fichte in this context is quite telling. In the end, the possibility of perceptual consciousness in his theory is fundamentally dependent on the Fichtean idea of “the acting I’s ability to experience itself immediately in its productivity [*sich in seiner Produktivität erfahrenkönnende handelnden Ich*]”, as Schulz (2004, 49) expresses it. The analysis presented in this paper aligns with Heidelberger’s take on the matter:

Helmholtz appropriated the view that our consciousness comes to shape its conception of the outer world through the limitations we experience in our practical actions. Only by actively interfering with the world of external objects can we interpret our sensations as due to external causes and thereby distinguish them from the free acts of thinking inside our consciousness. (Heidelberger 1993, 463)

Although the very idea of a Fichtean influence in Helmholtz’s work may seem to be at odds with Helmholtz’s strong anti-metaphysical stance, textual evidence suggests a restricted, but nevertheless important intellectual indebtedness.²⁷ As Turner

²⁷Evidence for this intellectual relation can be drawn mainly from Helmholtz’s letters to his father, as quoted in Koenigsberger (1902–03). For a full analysis, see De Kock (2014a, 2014b).

notes, Helmholtz apparently distinguished between “two aspects of Fichte’s thought,” and accepted Fichte’s philosophy to the extent that it “represented a phenomenology of consciousness,” while he “resolutely rejected Fichte’s . . . attempts to build an idealist metaphysics on that basis” (Turner 1977, 57). Unfortunately, it remains unclear what exactly Helmholtz had read of Fichte. In a 1841 letter to his godfather Immanuel Hermann Fichte, the young Helmholtz—a student in medicine at that time—stated that he has “recently studied some works of your great father [*ihrer Grossen Vaters*],” but unfortunately, he did not specify which works exactly he had studied. From a footnote in the second, revised version of his *Treatise*, it is clear that Helmholtz had been impressed by Fichte’s 1817 *Facts of Consciousness*, about which he writes that it contains “correct and precisely articulated [*Richtige, scharf ausgesprochen*] insights” on the nature of sense perception. Furthermore, it is reasonable to assume, as Turner does for example, that Helmholtz must have had some degree of familiarity with the *Science of Knowledge*. Helmholtz’s available writings and correspondence do not, however, provide decisive evidence on that matter (Turner 1977).

Without downplaying the importance of getting a firmer grasp of the factual historical relation between the two authors, however, this paper has presented an alternative angle from which to study the Fichtean elements in Helmholtz’s thought, and his wavering between empiricism and transcendentalism. That is to say, the historical narrative constructed in the previous pages allows a better grasp of the philosophical stakes of the intertwinement of philosophical perspectives in Helmholtz’s theory of perception. To be sure, although this exposition could well provide a different angle from which to approach Helmholtz’s theorizing, it does not assume that the latter arose from a *self-conscious* attempt to overcome the problems of empiricism. However, Helmholtz’s normative qualification of the subject as autonomous and self-determining seems to circumvent the clas-

sical problems of circularity and infinite regress. Nevertheless, the position Helmholtz developed on this topic is as ingenious as it is fragile, as will be clear from the concluding remarks.

5. Discussion and Conclusion

In this contribution, a historical framework was introduced that served as an interpretive tool in trying to get a firmer grasp of Helmholtz’s wavering between empiricism and transcendentalism, specifically with regard to the problem of differential consciousness. After placing Helmholtz within a historical narrative stretching from Hume to Mill, it was argued that he overstepped the boundaries of the strict naturalist framework when he founded the possibility of association in the unconditioned will’s impulse, or more generally, in his normative qualification of the epistemic subject as free and autonomous. In doing so, it seems Helmholtz was in a better position to avoid the problems of empiricism in accounting for differential consciousness, most notably circularity and infinite regress. However, Helmholtz’s peculiar appropriation of insights from the transcendental tradition within his psychophysiology raises complex questions of its own. For instance, there is Helmholtz’s peculiar appeal to “inner intuition” as the basis of the sense of agency, and more particularly, to his rather vague and dubious use of the term. In 1896, Helmholtz used it interchangeably with the notion of self-consciousness, which he in turn defined in terms of self-observation (Helmholtz 1896, 577). Given that self-consciousness would therefore be equated with a form of observational knowledge, one could obviously object that it can no longer fulfil its foundational role with regard to the problem of differential consciousness and invites problems of circularity. But even if one would stick to Helmholtz’s 1878 definition of inner intuition in terms of an immediate *feeling* of self-determination, some important issues remain. For one thing,

it raises questions with regard to Helmholtz's well-known criticism of "the older concept of intuition", and sets limits to his self-professed ambition to resolve at least part of that older concept into the concept of thought. Indeed, the definition of the "older concept of intuition" as something that "comes to consciousness immediately with the sense impression and without recollection and effort" could well apply to his own concept of inner intuition, that refers exactly to this kind of effortless, unmediated (self-)consciousness (1878, 355). So while Helmholtz's emphasis on the inferential nature of object perception derived at least in part from an attempt to rethink the old concept of intuition—especially its alleged immediacy—by introducing the hypothesis of unconscious inference, this criticism seemed to be entirely absent in his use of the notion of inner intuition. Furthermore, it is not very clear how one should interpret this immediacy criterion, as it seems to hover somewhere in between the status of a normative principle and a sensible given, or more generally, between logical apriority and psychological givenness. That is to say, while Helmholtz established the principle of free will as a regulative principle for psychology, he went on to inscribe this normative view regarding the possibility of self-determined action onto our inborn psychophysiological organization, at which level it functions as a sort of naturalized *a priori*. As such, we are once again faced with the much-debated issues surrounding Helmholtz's peculiar appropriation of transcendentalism in general, and of the *a priori* in particular.²⁸

Additional interpretive difficulties arise, for example, from Helmholtz's attempt to incorporate the intuitive awareness of the will's impulse into his physiological analysis, where it resurfaces in the concept of the sensation (*Empfindung*) of the intensity of the effort of will (*Intensität unserer Willensanstrengung*),

²⁸For some interesting discussions on this topic, see for example [Natorp \(1888\)](#), [DiSalle \(1993\)](#), and [Patton \(2009\)](#). For a detailed discussion of Helmholtz's struggle with Kant's concept of *Anschauung*, see [De Kock \(2016\)](#).

and basically denotes the sensible correlate of self-generated action ([Helmholtz 1856–66](#), 599). The latter is, however, specified as a *purely mental event*, and as such, distinguished from the physical manifestations of voluntary action, i.e., the "tension of the muscles [*Spannung der Muskeln*]" and the (visible) "results of the effort [*Erfolg der Anstrengung*]" (1856–66, 599). Although physiologists after Helmholtz—most notably Wilhelm Wundt—would later adopt and further elaborate on this peculiar concept, it soon came under attack as a redundant hypothesis and an undesirable remnant of idealist metaphysics in the science of physiology.²⁹ The main problem identified by opponents pertained to the idea of adding a component of feeling or awareness to the mere physiological fact of a central discharge from the nervous system into the motor centres. In addition to these anti-idealist objections, however, one could also contend that with this complete reduction of the formal condition of self-reflexive spontaneity to a sensation or feeling one reopens the door towards infinite regress. After all, if the subjective pole of consciousness comes into being with the feeling of effort, than what or who generated the effort? According to some, this leads us right back into Hume's *Labyrinth*. [Frank \(2007, 169\)](#), for example, contends that "[t]hat which, according to the model, should function as the criterion for whether an action is one's own, has no ownness to it and therefore . . . cannot function as the criterion." In conclusion, although the historical framework presented in this analysis provides a fresh angle from which to consider Helmholtz's empirico-transcendentalism with respect to the problem of differential consciousness, the degree to which he succeeded in evading the problems of circularity and infinite regress remains a matter of debate.

²⁹Most notably see von Kries in his comments on Helmholtz's 1856–66 *Treatise*; also see [James \(1890, 496–593\)](#). For a somewhat more recent sketch of the historical debates on that topic, see [Jeannerod \(2006\)](#).

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