UNIVERSITÄT PADERBORN
Die Universität der Informationsgesellschaft

UNIVERSITÀ DEGLI STUDI FIRENZE

PhD in

Philosophy

CYCLE XXXII

COORDINATOR Prof. Adriano Fabris

Hermann Lotze on the Mind–Body Problem and the 19th Century Philosophy and Psychology: With Special Attention to William James

Academic Discipline (SSD) M-FIL/06

Doctoral Candidate

Michele Vagnetti

Supervisors

Prof. Alessandro Pagnini

Apl. Prof. Dr. Nikolay Milkov

Coordinator

Prof. Fabris Adriano

Years 2017/2020

CONTENTS

1. Preliminary remarks on Hermann Lotze's metaphysics

1.1. Lotze on science and metaphysics

In the "Preface" to his *Mikrokosmos*, Hermann Lotze wrote:

> But all the same it is in such mediation alone that the true source of the life of science is to be found; not indeed in admitting now a fragment of the one view and now a fragment of the other, but in showing how *absolutely universal is the extent* and at the same time how *completely subordinate the significance, of the mission which mechanism has to fulfil in the structure of the world.*[1]

The previous quotation allows us to frame the core of Rudolph Hermann Lotze's thought: the search for a conciliation and a mediation between the deepest needs of human mind and the results of scientific research. The truth to which scientific research aspires is related to the movements of the mind; in order to be accepted as true, every theory must correspond to man's deepest needs. In search for truth, man cannot take into account only the inner world of feelings and of the movements of the mind, without resorting to scientific research. Undoubtedly, this latter plays a principal role in the search for truth. On the other hand, it is not possible to acknowledge only the value of the results of scientific research, without taking into account the reality of man's inner life. This latter is what actually allows man to recognize the existence of a trans-sensual reality, about which science cannot say much.

According to Lotze, through the notions of natural forces and laws, science cannot reach

[1] R. H. Lotze, *Mikrokosmus. Ideen zur Naturgeschichte und Geschichte der Menschheit. Versuch einer Anthropologie* (Leipzig: S. Hirzel, 1856–1864); new ed., *Mikrokosmos*, Nikolay Milkov (ed.), (Hamburg: Felix Meiner Verlag, 2017), XIII*; english trans., *Microcosmus: An Essay Concerning Man and his Relation to the World*, E. Hamilton and E. E. Constance Jones (trans.), (Edinburgh: Clark, 1885), 2 vol., xvi.

the essence of the world, since this is rooted in trans-sensual reality. Such a reality cannot be measured and, therefore, is downgraded by science as indeterminate and nebulous. Lotze recognized the considerable progress of mechanical science in the three decades before the publication of his *Medicinische Psychologie* (1852); his task was to preserve human sphere from those materialistic and reductionist interpretations that reduce the life of the mind to a physical mechanism.

Lotze's aspiration for a mediation between very different positions becomes clear in his analysis of the German philosophical schools of his time: German Idealism, Johann Friedrich Herbart's realism and Jakob Friedrich Fries' mathematical understanding of reality. Lotze critically analyzed these traditional perspectives by choosing and adopting, among their arguments, those that he considered correct, without adhering however to any of these schools.

Although Fries greatly influenced Lotze's view on scientific method, Lotze never embraced determinism, since it was at odds with his own moral perspective. Lotze strenuously defended the free will and criticised Fries who had extended mathematics and deterministic physics to biology and psychology; in his opinion, even living beings had to be subsumed within a mechanic-mathematical explanation.

Lotze's thought was also greatly influenced by Herbart, who had provided the main coordinates of the realistic method: Realism represents the foundation of Lotze's thought. Because of his inclination to critical selection,[2] although Lotze assimilated Herbart's realism

[2] Lotze's critical method consisted in a critical selection of elements from Herbart's realism and Hegel's idealism. This selection is a critical activity which allowed Lotze to select only those theories, offered by the philosophical schools of his time, which, taken as a whole, were not contradictory. He rejected the realistic metaphysics according to which the structure of the world is 'real' and, on the other hand, embraced the attention of

as a fundamental element of his own philosophy, still he did not consider mathematics as a cornerstone of scientific psychology.[3] The realist method is something that Lotze's philosophy shared with natural sciences. Starting from realistic positions, Lotze's thought reached idealistic conclusions.[4]

Lotze's accurate critical analysis of scientific notions revealed his competences in medicine, his realism and objectivism: in science, man should not be interested in the knowledge of reality in itself, but only in those empirical properties that can be object of experiment. Certainly, such a philosophical perspective can hardly be reconciled with the conception of reality—suggested by Kant and Hegel—as mere representation of thought.

In general, however, Lotze owes much to Kant's teachings. However, according to Lotze, we cannot deal with the faculties of human mind, if we do not first tackle the ontological nature of the things in front of us. For this reason, Lotze firstly focused on the empirical properties of things, which led him to atomism.

Kant's Copernican revolution in epistemology and the primacy of practical reason he maintained were adopted in the philosophical elaboration of Lotze, who, gradually shifting from scientific realism to idealism, never embraced uncritically scientific results, without verifying whether they were compatible with human moral sphere. He strongly opposed

---

realism to the concrete scientific research. Similarly, he accepted the idealistic metaphysics according to which the structure of the world is 'ideal' but, at the same time, rejected Hegel's idealism because it deprived the ideal structure of its concrete content. It led Lotze to state the possibility of a coexistence without contradiction between the two German philosophical schools.

[3] We will later see in detail how Lotze denied Herbart's project of mathematization of psychology.

[4] See: G. Santayana, *Lotze's System of Philosophy*, P. G. Kuntz (ed.), (Bloomington: Indiana University Press, 1971), 109–29.

materialism, proposing a model of science based on man's moral needs: this perspective suggests that nature and reality are provided with a purpose and a meaning that emerge in different ways and allow us to elaborate a new concept of science based on "living hypothesis" and not only on "working hypothesis".[5] This perspective fundamentally relies on a conception of nature as macrocosm, as a great organism able to orient itself. The disciplines that Lotze took into account here are above all biology, physiology and psychology.

As we read in the text cited at the beginning of this chapter, Lotze's main objective was to reach an equilibrium between man's moral and aesthetic needs, on one hand, and the needs and results of the scientific research, on the other; this assumption led Lotze to embrace a general mechanical theory of nature which has, however, to be circumscribed and clearly corrected. The problem of the explanation of reality is a pivotal element of his philosophy, which, once again, recalls the axiom of conciliation between the mechanical description of reality and the purposiveness of nature. Laws of nature have the logical status of hypothetical judgment, because what a law states will necessarily occur, if certain conditions are fulfilled; in other words, a law is nothing more than a relation between a reason and its implication. Thought is able to grasp experience thanks to the hypothetical principle; according to Lotze, knowledge has always a hypothetical value.

Lotze considered this conception even more problematic because of the ineffectiveness of the natural law. As a logical relationship between premise and consequence, natural law is not able to produce any change in the physical world, nor does it allow to understand why there are certain conditions in it and not others, considering that these conditions are those to which law applies. Precisely for this reason, at the level of scientific operativeness—the methodological-investigative level—the idea of pure law is accompanied by the notion of

[5] *Ibid.*, 128.

cause which is actually present in reality and whose effects match with the law. The question of the contingency of the beginning, however, remains unsolved. In fact, the notion of end is the fundamental notion of Lotze's concept of science. He does not mean to say that a part of reality is subject to laws and another part to a finality. The fact that the whole reality is subject to the laws of nature, according to Lotze, does not contradict the idea of an end.

In this sense, scientific laws do not operate according to the principle of sufficient reason. In other words, they cannot determine whether a thing is such and not something else. The laws of science are only principles based on the assumption that there are given facts which produce effects in the world with necessity. Moreover, according to Lotze, science cannot explain why reality assumes this or that determined form. This observation results in the question of the individual and morphology. With respect to reality, Lotze's idea of purpose played the same role as the principle of sufficient reason. The scientific description of the world according to the mechanical model stimulates the philosophical issue of the meaning of man, of human life and of the totality of nature; for this reason, Lotze refused to embrace the results of scientific research without a philosophically critical attitude. This attitude is testified by the way in which Lotze philosophically dealt with the principle of conservation of energy (*Erhaltung der Kraft*). Lotze considered this principle as an indispensable scientific assumption. In fact, he employed it as a means of investigation, although he clearly stated that it had not a final and objective metaphysical validity. According to Lotze, man comprehends the cosmos in two distinct ways between which man himself needs to mediate: the scientific description (*Beschreibung*) of events according to the mechanical model and the meaning (*Bedeutung*) of the totality of events or world for man. In this case, the principle of conservation of energy is valid from a descriptive point of view but not from a metaphysical one. Lotze did not accept the metaphysical validity of this principle, because embracing this principle would prevent new forces to emerge in the course of events, and this would work

against man's aesthetic needs: in other words, this would make the world basically monotonous. An indispensable metaphysical principle of Lotze's philosophy is the conception that the world has a fundamental poetic essence that can only be ensured by preserving its vitality, freedom and poetry. The principle of conservation of energy works against it.

Lotze's philosophy developed these two aspects in parallel: we have an access to reality both at superficial levels and at structural levels that grasps reality as a whole. It can also occur that a principle may be valid at one level but and not at the other. Importantly enough, this does not make Lotze's philosophy contradictory, but moderate and comprehensive.

1.2. Lotze's atomism

Lotze's realism was very different from that of Herbart, according to whom the core of metaphysics was the motionless, unrelated substances and whatever man perceives as movement and relation was not a substantial but just an accidental property, which was thus considered as belonging to the field of psychology. Lotze introduced the problem of metaphysics in a completely different way from Herbart, by stating that the change and relationality of substance have a metaphysical and not a psychological value. Reality itself is changing and relational; substances are always in relation to each other. Lotze supported a constructivist theory of substance, in which this latter is considered as a whole composed of parts which, in their turn, are related to each other. Reality conceived as a whole made up of parts in relation to each other is discrete and not continuous. The parts composing the whole are atoms which are not identical with the ancient notion of atom, but are rather metaphysical points without extension (*unräumlich*). Extension is a secondary characteristic of atoms, appearing only when these latter are identified and differentiated as starting points of the inner relations of the whole substance.

According to Lotze, metaphysics deals with the analysis of our phenomenal world[6], understood as given reality; the role of change was central in Lotze's metaphysics, as much as that of temporality, which clearly distinguishes metaphysics from logic, in which the notion of *Geltung* is absolutely timeless. The key concepts of Lotze's metaphysics were those of atom, whole and relation: the parts (atoms) of the substance establish a relation to each other, giving rise to the whole (substance). Only the atom, the whole and the relation have trans-sensual value. Space, matter and extension *per se* have no metaphysical value. Lotze excluded both a materialistic metaphysics that might hypostatize matter and save it from change, and an idealistic metaphysics that might hypostatize ideas. Lotze rejected the Newtonian way of understanding space and matter (extension) as eternal and immutable; he preferred a metaphysical unreality of space and matter, considered as mere human ideas that man constructs on the basis of external stimuli.[7]

The reality that we perceive is a material and three-dimensional spatial extension. When we explore the essential and metaphysical nature of reality, we see how limited and reduced in our perception it is, despite the fact that its configuration is not misleading. Lotze's

[6] Lotze addressed the issue of metaphysics from a human point of view. He denied Herbart's metaphysics and introduced temporality and history into this discipline. He understood metaphysics from an anthropological point of view. See: N. Milkov, "Einleitung", in: R. H. Lotze, *Mikrokosmos*, N. Milkov (ed.), (Hamburg: Felix Meiner Verlag, 2017), XLVI; E. W. Orth, "R. H. Lotze: Das Ganze unseres Welt- und Selbstverständnisses", in: Josef Speck (ed.), *Grundprobleme der großen Philosophen.* Philosophie der Neuzeit IV, (Göttingen: Vanden-hoeck & Ruprecht, 1986), pp. 9–51, p. 43.

[7] It is important to highlight the different use of the term 'idea' in Lotze and Kant. In Kant, the subjectivistic and formal root was predominant, whereas in Lotze the idea had an empirical-objectivistic root: it tells us something about external reality. In Kant the idea deals with man, in Lotze it is a—non-total, but partial and perfectible—opening to external reality.

realistic position maintained that our objective perception and experience as well as our scientific research are able to give us some information about the configuration of external reality, despite the fact that they are not able to achieve its essential meaning. Lotze's realism and objectivism can be synthesized in the idea that the world is not made by us, but rather given to us in our objective perception and experience. The conceptualizations in scientific research can tell us something about the world, provide us with information about it. However, this ability to provide information on the outer world is limited.

Our scientific conceptualizations provide us information about the world, but they do not exhaustively represent its meaning: there is always something unsaid that belongs to metaphysics and the philosophical speculation. Lotze's realism thus highlights the limits of human scientific knowledge which is clearly devoid of universal and metaphysical value. In order to explain this point, we might mention several examples of dualism—material/immaterial, extended/unextended—which could be seen as cases of the general mind/body dualism that we frequently encounter in our objective scientific experience. This dualistic aspect that Lotze described in the terms of occasionalism (on it we will focus later), can be useful for science—in particular, for scientific psychology—to account for some recurring elements at physical and psychic level. However, science cannot claim at that to have advanced a positive theory but simply an operational-methodological description with no metaphysical value.

According to Lotze, metaphysics is not dualistic, and this because it deals with the whole (with the substance) and the internal relations between unextended atoms in it. Furthermore, Lotze elaborated a metaphysics of the un-extended, mentalistic reality, although it is based on realism. According to him, human knowledge is based only on itself, that is, on its own ideas and conceptions, so that it can be neither confirmed nor falsified. Moreover, since knowledge cannot reveal its self-contradictory nature, one has to comply with the claim for a

transcendent knowledge—he must trust human reason. Important point is that trust does not mean uncritical acknowledgement of every result of knowledge, but an accurate analysis of every product of human thinking. Lotze did not embrace the dogmatic idealism, which did not recognize human knowledge as endowed with informativity, but, respecting the form of objectivity of our mind and the conviction that ideas are always related to something. He adopted a form of critical idealism[8] that confirmed as valid only those ideas that meet human values and needs and discards those that apparently contradict those values. Science should also embrace this critical idealism, in order to function properly.

One consequence of this position was that Lotze was confronted with the problem of justifying the transition from the immaterial and un-extended atoms to the materiality that we experience in our perception. The assumption of the metaphysical unreality of matter only shifted the problem to the level of perception. How is it possible that an immaterial and un-extended atom can give rise to the material and extended bodies that we perceive? Pure extension in itself does not represent a problem, because—as we have seen—unextended atoms are points related to each other through their mutual resistance and they give rise to a

[8] The critical selection, mentioned above, led Lotze to develop his peculiar critical idealism. He was an idealist because from a metaphysical point of view he understood primordial reality as ideal or mental but, on the other hand, he tried to avoid Hegel's formalism. Hegel considered the mind as the pure form of the mind without reference to any specific content. For this reason, according to Hegel, psychology was the discipline that dealt with the development of the pure form of the mind. According to Lotze, it was impossible to determine a priori the development of the mind but on the basis of physiological and biological experience and therefore on the basis of determined and concrete contents.

n-dimensional extension understood as an infinite multiplicity of directions.[9] The knowing subject can only perceive three-dimensionality. Apparently, the real problem lies in the empirical characteristics of matter as well as in its solidity. If atoms are—metaphysically understood—immaterial and un-extended points, how is it possible for them to give rise to the solidity of the material world that we perceive? The subject to which sciences refer is the world that we perceive, with its different empirical characteristics; an unextended atom, a metaphysical or immaterial point, is not a notion that can be adopted by physical science because the point is a geometric concept, whereas physical forces and movements are based on the idea of materiality. If the ultimate components of reality are immaterial, how do physical forces operate on immaterial points? The forces operating on mathematical-geometric points are without effect in the realm of matter, they do not activate on material bodies. The question, therefore, does not completely account for the problem highlighted by Lotze, that is, the impossibility of a transition from the metaphysical to the perceptive level, understood as the subject's perspective on reality. According to Lotze, reality has four spheres of meaning—being, happening, existing, and being valid—, and none of the four can be reduced to or included into another. These four forms of reality are fundamental and irrevocable concepts entirely based on themselves (*in sich selbst beruhenden Grundbegriffe*). In Lotze's words:

> For we call a thing Real which is, in contradistinction to another which is not; an event Real which occurs or has occurred, in contradistinction to that which does not occur; e relation Real which obtains, as opposed to

[9] Nikolay Milkov wrote on Lotze's atoms: "To be more specific, we conceive of them as impermeable, filling up the space, only because of their demonstrated reciprocal resistance (1856a, p. 402)." (N. Milkov, "Rudolph Hermann Lotze (1817–1881)", *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/lotze/).

> one which does not obtain; lastly we call a proposition Really true which holds or is valid as opposed to one of which the validity is still doubtful. This use of language is intelligible; it shows that when we call anything Real, we mean always to *affirm* it, though in different senses according to the different forms which it assumes, but one or other of which it must necessarily assume, and of which no one is reducible to or contained in the other.[10]

Metaphysics deals with what is given to us and what is; psychology focuses on the way in which man perceives a happening event (*Localzeichen*); logic deals with the timeless validity of our judgments, concepts and *Sachverhalte*. The transition from one of these three disciplines to the other is impossible. Reality is perceived by the subject in a certain way, and we must not confuse what reality is for the subject, with what it is in itself. Human thought has a limited but not a misleading access to reality (here we recognize the realist and objectivist roots of Lotze's philosophy); human perception and objective experience are able to grasp only small portions of reality that, from a metaphysical point of view, have not a necessary and a priori value. The problem of the human perception is treated in detail in *Medicinische Psychologie*, in which Lotze developed his theory of local signs that we will discuss later.

In conclusion, Lotze's philosophy achieved a consideration of reality from a mental perspective. His main thesis was that the analysis of reality—of the multiple material reality—leads us to consider this latter as a single factor of a whole mental process. Even if we consider Lotze's philosophy as a path leading to a mentalistic metaphysics, it is nevertheless important to grasp its intermediate points, that is, that his realistic starting point led him to tackle the development of the scientific research of his time.

[10] R. H. Lotze, *Logik. Drei Bücher vom Denken, vom Untersuchen und vom Erkennen* (Leipzig: S. Hirzel, 1874), 499–500; engl. trans., *Logic*, (B. Bosanquet et al., trans.), 2nd ed., (Oxford: Clarendon Press, 1887), 439.

1.3. Philosophy of space: metaphysics and geometry

Lotze dealt with the notion of space since 1840, when he wrote his *Habilitationsschrift* in philosophy entitled *De summis continuorum*, in a strong and increasingly exacerbated opposition to his mentor C. Hermann Weiße. Lotze presented his critical analysis of Weiße's conception of space also in *Bemerkungen über den Begriff des Raumes, Sendschreiben an D. Ch. H. Weiße* (1841). We should be aware that Weiße had played an important role in the education of the young philosopher Lotze. Thanks to Weiße's criticism of Hegelian idealism—by adopting Leibnizian arguments—the young Lotze could study more in depth Leibniz's philosophy, which was fundamental for the development of his notion of space.

As a speculative theist, Weiße criticized Hegel's principle of identity between thought and being, rationality and reality, stating that the concrete and individual reality always possesses something more (*das positive Mehr*) than pure conceptual knowledge. There is no conciliation between the concrete (understood in its facticity) and the abstract. Hegel's system had been criticized not only by Weiße but also by I. H. Fichte, since, according to them, it had not considered concrete reality at all. These critical arguments were rooted in an anti-psychologistic perspective which did not entail any identification between the logical process and the objects of thought. The logical conditions of our knowledge as well as the thinkability of a thing (*cognitio circa rem*) should not be confused with the conditions of the thing itself (*cognitio rei*); concrete reality is always much richer than the logical thought that allows us to know it.

Moreover, Weiße attempted to reconcile the Hegelian system of necessity with Schelling's system of freedom, and to this end he drew on Leibniz's thought and his critical arguments against the monism of the logical and mathematical necessity of Spinoza's system. Leibniz stated that mathematics and logic represent only a "formal necessity", which is different from

the "real necessity or contingency" that, in its turn, is a fundamental aspect of human existence. Citing Leibniz's *Théodicée* (I, 34), in *Grundzüge der Metaphysik* Weiße wrote:

> In diesem Sinne behauptet Leibnitz, welcher dem Spinoza gegenüber diesen höhern Standpunkt (jedoch mit mehrfachen Modificationen, welche durch die Vorausnahme des noch Höheren, namentlich des teleologischen Moments herbeigeführt werben) repräsentirt, zwar eine von der logischen und mathematischen ausdrücklich unterschiedene, reale oder hypothetische Nothwendigkeit menschlicher Handlungen, und sagt dennoch von dem Willen als solchem, daß er frei, daß er entbunden nicht bloss von dem Zwange, sondern auch von der Nothwendigkeit ist.[11]

Lotze's interest in Leibniz's philosophy was mainly due to the influence of Weiße's work on him. Like his mentor, and like I. H. Fichte, Lotze admired Leibniz's thought. On this point, however, he also followed Herbart. Years later he remembered:

> ich ging in der That lieber durch das prachtvolle Thor, das er [Herbart] selbst seiner Metaphysik versichert zum Eingang aufbauen gekonnt zu haben: das Thor der Leibnizischen Monadenwelt.[12]

In particular, Lotze was impressed by Leibniz's preference for concrete and individual reality. This idea of Leibniz clearly influenced Lotze's 1838 first philosophy dissertation on Descartes, Spinoza and Leibniz as well as his dissertation for his first medical degree (*De futurae biologiae principiis philosophicis*) in which he presented a Leibnizian idea of value. But Lotze was also influenced by Leibniz's idea that space is relational and not absolute, as Newton interpreted it (as *sensorium Dei*).

[11] C. H. Weiße, *Grundzüge der Metaphysik* (Hamburg: Friedrich Perthes, 1835), 467–68n.

[12] R. H. Lotze, *Streitschriften* (Leipzig: S. Hirzel, 1857), 7.

From a philosophical point of view, space is pure relationality, a pure infinity of directions. In human perception and in the objective experience, space is perceived as three-dimensional, not because three-dimensionality represents the metaphysical essence of space in general, but because our experience is always partial, in particular, three-dimensional. Three-dimensionality is generally considered as the fundamental characteristic of space only because it appears as a factual evidence to our intellect. Lotze, however, questioned the principle of evidence. In this connection he criticized Weiße because the latter had given the three-dimensionality of space a metaphysical meaning (*Bestimmung des Raumes*). As Weiße wrote:

> Der Raum hat unabhängig von den concreten Dingen, deren allgemeine formale Voraussetzung und gleichsam deren Gefäß er ist, als Totalität in sich selbst, ein, wenn auch nur ideales, rein begriffliches Bestehen. Er ist die Totaleinheit jener zu gleich qualitativen und quantitativen Bestimmungen, welche den Inhalt der Geometrie ausmachen, obgleich sie von dieser Wissenschaft, wie oben bemerkt, nicht ausdrücklich als inwohnende Bestimmungen des Raumbegriffs gefaßt werden. Durch diesen Satz, daß der Inhalt der Geometrie einer und derselbe mit der inwohnenden Bestimmung des Raumes ist, wird dieser Inhalt ausdrücklich unter das Princip der Metaphysik gestellt oder dieser Wissenschaft einverleibt, entsprechend, wie im ersten Buche der Inhalt der Arithmetik.[13]

Since, according to Weiße, geometry and metaphysics are in a relation of an "absolute unity" (*Totaleinheit*), the content of Euclidean geometry should be able to exhaustively explain the metaphysical meaning of space itself.

Lotze opposed the idea of considering the infinity of space's possible directions as geometrical, that is, basing three-dimensionality on the right angle. His shift from a precisely

[13] C. H. Weiße, *op. cit.*, 351.

determined pure geometrical concept (three-dimensionality of space) to the metaphysical notion of space in general (infinite multiplicity of directions) completely changed the course of the reflection on this issue, which traditionally was based on the idea of automatic symmetry (identity) between geometry and metaphysics. Lotze considered such an automatic symmetry untrue. The metaphysical problem questions whether it is possible to reconcile the infinite directions of space—metaphysically understood—with the three-dimensionality of geometry and whether this can explain the nature of spatial extension. Reducing the metaphysical infinity of possible dimensions to three dimensions is clearly related to the possibility of determining the place (*Ort*) of a point through coordinates. This reduction cannot be used to construct a spatial extension or even just to symbolize its essential moments. Extension entails the infinite multiplicity of directions as its given possibility, whereas the notion of place only entails three possible dimensions for all the possible spatial relations between spatial figures. Reflecting on Leibniz's concept of possibility, Lotze tried to develop his conception in both a philosophical and a mathematical perspective. The fundamental idea of Leibniz was that space is not a pure receptacle (*Gefäß*), but the order of what continually fills it.

In his second philosophy dissertation (habilitation), *De summis continuorum*, Lotze explicitly stated that Euclidean geometry cannot adequately explain what space is. He proposed a clear distinction between extension (*Ausdehnung*) and place (*Ort*). The notion of extension is a philosophical concept of pure multiplicity of possible directions—in whose construction mathematics plays a fundamental role—whereas the place "makes these possibilities concrete, putting them into three coordinated directions".[14]

[14] N. Milkov, "Rudolph Hermann Lotze (1817–1881)", *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/lotze/.

According to Lotze, space is the infinite number of relations and dispositions of elements considered as empirical conditions of an event. In this sense, Lotze can be undoubtedly considered as a thinker of "new empiricism".[15] He rejected Kant and Fries' conception of space as innate intuition, because he did not consider space infinitely extended in three dimensions as a true (innate) element of our consciousness. Human mind rather orders the elements of perception according to a spatial pattern, so that only through a retrospective reflection (*spätere Reflexion*) we are able to grasp the infinite number of possible relations and spatial dispositions of these elements which, therefore, cannot be limited to the geometrical three dimensions. According to Lotze, precisely this retrospective reflection allows our consciousness to reach a comprehensive vision (*Gesammtanschauung*) of all possible and infinite spaces. In Lotze's words:

> Wir meinen damit nicht, dass der unendliche nach drei Richtungen ausgedehnte Raum von selbst ein immerwährender Gegenstand unsers Bewusstseins sei, den wir etwa seit unserer Geburt in Gedanken anstierten, begierig, ihn mit Bildern zu füllen. Wir meinen nur, dass die ursprüngliche Natur unsers Geistes uns dazu treibt, unsere Empfindungselemente in räumlichen Lagen zu ordnen, und dass eine spätere Reflexion auf die unendliche Anzahl solcher Anordnungen, die wir unbewusst vorgenommen haben, uns auch die mehr oder minder lebhafte Gesammtanschauung des alle umfassenden unendlichen Raums zum Bewusstsein bringt.[16]

This philosophical reflection on the concept of space in itself was carried out by Lotze in his 1840 second dissertation in philosophy in which he provided a mathematical account of

[15] W. R. Woodward, *Hermann Lotze. An Intellectual Biography* (Cambridge University Press, 2015), 79.

[16] R. H. Lotze, *Medicinische Psychologie oder Physiologie der Seele* (Leipzig: Weidmann'sche Buchhandlung, 1852), 335–6.

space. Like Fries, Lotze considered mathematics of great importance to philosophical reflection. Although he did not agree with Fries' Kantian perspective on the concept of space, he undoubtedly owes Fries the idea that philosophical reflection should embrace mathematics as an integral and unavoidable part of its own development.

As an anti-psychologist, Lotze definitely separated the psychological and physiological consideration of space, presented in the *Medicinische Psychologie* as "*Localzeichentheorie*", from the logical-philosophical concept of space, considered as validity and ideality (*Ausdehnung*). This latter was analysed by Lotze in his *De summis continuorum*, in *Mikrokosmos* and also in his *Logik* (1874). In his 1840 dissertation Lotze stated that Euclidean method was not adequate to deal with geometry philosophically. For this reason, he tried to identify the mathematical formulas in order to calculate the area of several geometric forms, based on the assumption that these latter can be *constructed* from infinite arithmetic series: he did not use Euclidean evidence but mathematical constructions.[17]

The idea of construction is at the core of Lotze's thought, which he further developed in his "greater" *Logik* (1874), and is essential to understand the relation between Lotze's thought and Kant's philosophy; Lotze generally embraced Kant's perspective, except for some reservations that highlight Lotze's critical nature.

In *Mikrokosmos* Lotze also dealt with the problem of spatial representation and clarified his relation to Kant's philosophy on this topic. In the fourth chapter of the second book, partly dedicated to the question of innate ideas, Lotze tackled the problem of space, proposing a preliminary distinction between "*quaestio juris*" and "*quaestio facti*". He rejected associationism, according to which our judgments are mere connections of ideas that

[17] On the concept of construction see: R. H. Lotze, "De summis continuorum" (1840), *Kleine Schriften*, I, 63–64; W. R. Woodward, *op. cit.*, 82–86.

the psychological mechanism of representations explicates as simple empirical material coexisting within our experience (*zusammenhängen*). Lotze considered this approach to the problem of judgement irrelevant with respect to the real point, the "*quaestio juris*", that is, the validity of judgement. According to Lotze, what converts the merely coexistent material of a judgment to a coherent (*zusammengehören*) and therefore valid judgment—whose elements intrinsically belong together—is only a retrospective activity of our thought on this material, that we access through a psychological mechanism.[18] Here Lotze also distanced himself from the psychological interpretation of Kant's thought that Fries proposed in *Neue oder anthropologische Kritik der Vernunft* (1807).

Lotze considered the coherence of judgment as product of a retrospective activity of thought on the material provided by our psychological process. Quite consistently, he did not consider, like Kant, the concepts of space and time as innate ideas, since these concepts are produced (*erzeugt*) by the thought's activity. However, this does not mean that he considered them less universal and necessary. Their validity is guaranteed precisely by the fact that they are constructed by the activity of thought (*die Tätigkeit des Denkens*), since this is what constitutes their coherence and validity. This argument is based on Lotze's idea that our consciousness is not a mirror that reproduces precisely the image of the outside world, but rather a continuous critical activity that examines all the data that it receives, re-elaborating them in accordance with its own criteria. As Lotze stated:

> we saw how the mechanism of association and reproduction combined certain impressions more closely than others, and how a degree of system was introduced into the motley multitude of retained impressions, which gathered together the similar and separated the dissimilar. Yet even here, all these laws of the train of ideas by their operation created only relations between the several acts of the cognitive activity, created objects of

[18] See: N. Milkov, "Lotze's Concept of 'States of Affairs' and its Critics", *Prima Philosophia* 15: 437–50, 2002.

> an intuition that might afterwards come; they did not show the scrutinizing glance that apprehends and interprets that order. It is in a third performance that we first meet with the glance of the mental eye, in the intuitions of Time and Space, into which the mind's uniting and relating action translates, as into a new language of its own, the mutual relations of impressions.[19]

And also:

> Thus both space and time, the relations of impressions in both space and time, are not something found and picked up all ready on its path by our cognitive energy, but are evolved from itself.[20]

The second chapter of the ninth book of *Mikrokosmos* is dedicated to the doctrine of the ideality of space. In these pages Lotze clearly embraced Kantian perspective, although with a few reservations about the idea of the innateness of the a priori form of space. According to Lotze, space and spatial relations are simply forms of our subjective intuition and cannot be applied to things nor to the relations between things *per se*, understood as the cause of our individual subjective intuitions. Lotze further stated that our representations are not what they mean—thus providing a clear distinction between representation and content of representation,—so that our spatial intuition is not spatial but it is rather its content that is provided with a spatial meaning. Spatial relations are not between representations, but between their contents. We generally think that space as well as the relations between the things that we perceive exist also outside us and precisely between things. Actually, our intuition of space, our perception of spatial relations arises from the interaction of our sensations or of the inner states of our nature (*Wechselwirkung von Eindrücken oder inneren Zuständen unseres Wesens*) which are neither spatial in themselves, nor are their interaction.

[19] R. H. Lotze, *Mikrokosmos*, I vol. 257–8; engl. trans., 229.

[20] *Ibid.*, 259; engl. trans., 230–1.

In this sense, space is not a form of our intuition (*Form unseres Anschauens*) in which our mental activities operate and from which our spatial image of the world emerges; space is rather the form of our intuition (*Form unserer Anschauung*) considered as a product (*Erzeugnis*) of our consciousness. In this way, starting from purely non-spatial, intensive activities and states of our representative activity, consciousness produces the appearance of an infinite extension.[21]

The way in which we develop and construct our spatial intuition from the interaction of non-spatial sensations cannot provide an answer about the spatiality or non-spatiality of the external world which is the source of our sensations. Even if the external world was actually spatial, in order to be known, it should be translated into our inner language which is not spatial; the extended images of things as well as their size relations could not be perceived. In order to be perceived and known, the sensations coming from an actual spatial world should be converted into an ordered multiplicity of non-spatial stimuli of our mind, which is the only possibility for us to construct our intuition of the spatial world.

The psychological research, which explains how we develop the intuition of space and whether such intuition is innate in our mind, is not able to answer the question about the actual spatiality of the world. Only metaphysics can determine the type of reality (*Wirklichkeit*) of space. The reality of space is the ideality (*Idealität*).[22]

Lotze embraced Kant's theory of space ideality but criticized his innatism. According to Lotze, Kant's mistake consisted in having based his doctrine of the ideality of space on the assumption that our spatial intuitions have to be innate, in order to be as universally and necessarily valid as geometry is. According to Lotze, innatism cannot provide universality

[21] See: R. H. Lotze, *ibid.*, III vol., 485–88.

[22] See: *ibid.*, 489.

and necessity to the notion of space. If we considered space only as the subjective form of human intuition, as an a priori and innate intuition of our mind, the idea of space would depend on the nature of the knowing subject and we could not account for other possible knowing beings, endowed with other forms of intuition and, therefore, we would not guarantee the universality and necessity of space. Lotze considered innatism theoretically too weak as a possible foundation of the universality and necessity of geometry.[23]

Our spatial intuitions, as ideals, do not apply to outer things in themselves, because they are mental. According to Lotze, from a metaphysical point of view there is no extended matter filling the space, as common sense would suggest. Metaphysically, there are only unextended atoms, which through their forces (*Kräfte*) outline some paths, thus producing within our intuition images of an extended materiality. Properly speaking, extended materiality is a product of the movements and changes of the intensive states of our mind.[24]

In *Logik* (1874) Lotze added that what he defined as the universality and necessity (*Notwendigkeit*) of the intuition of the space—the postulates of geometry—is simply based on their self-evidence, given to us by intuition, and not on their being innate. Before that, in *Mikrokosmos*, Lotze outlined the difference between the concept (*Begriff*) and intuition (*Anschauung*), stating that space and the general laws of spatiality are not concepts but intuitions. Lotze's idea of space is formless (*gestaltlos*) and therefore able to assume infinite different forms and relations which he conceives as multiple orders of a variety (*Vielheit*). More specifically, Lotze defined space as "the possibility of the juxtaposition of a plurality".[25] The general laws of spatiality—the principles of geometry—present space as an

[23] See: *ibid.*, 494.

[24] See: *ibid.*, 485–86.

[25] *Ibid.*, 490; engl. trans., II vol., 606.

infinite whole (*unendliches Ganze*). These principles—whether conceived as innate ideas or as the first products of the mutual action of our sensations (*erstes Erzeugnis der Wechselwirkung unserer Eindrücke*)—are nothing else than the immediate certainty (*Gewissheit*) that one single straight line passes through two points. As such, space and the laws of spatiality differ formally and essentially from the laws of formation (*Bildungsgesetze*) prescribed by the general concept to its particular examples. The general concept only requires each of its particular examples to be constituted of a group of marks (*Gruppe von Merkmalen*) connected to each other in a certain way. Moreover, the particular concepts are always subsumed under the general concept, whereas the laws of spatiality connect the particular and concrete space to the space as a whole. In other words, individual examples of space are not considered simply as examples of a general concept of space but as parts of a whole space coordinated and structured according to the general laws of spatiality. The specificity of the laws of spatiality is the possibility of an unlimited progress (*endloser Fortschritt*), an idea that can be included in the specific nature of the series (*Reihe*), through which space extends infinitely. As Lotze wrote:

> space appears to us as a kind of integral by which that whole is given which proceeds from the summation of all the infinitely numerous applications of the law of juxtaposition, when we abstract wholly from the nature of the reality that stands in those relations, and substitute for it the mere empty framework of the related points. Now when we have once got hold of the intuition of space, space appears to us as the all-embracing whole, in which and through which is possible the multiplicity of all those relations from the summation of which it has itself really originated.[26]

[26] *Ibid.*, 492; engl. trans., 609.

In his "greater" *Logik* (1874) Lotze dealt again with the question of space, stating that geometry is synthetic a priori and that through intuition we are able to grasp the principles of geometry as self-evident. Geometry has no logical-analytical basis—the principle of identity and contradiction—but requires the intervention of intuition to show its principles as self-evident and preserves its a priori nature, even if intuition refers to experience. Lotze later explicitly stated that intuition is the basis of self-evidence and not of induction, based on the repetition of particular examples. In *Logik* (§ 357) he also criticized Kant's grounding the a priori character of spatial intuition on mere innatism. In other words, Lotze criticized the use of the term "a priori" in the sense of "innate" because, in his opinion, this latter meaning is completely irrelevant:

> It is not because the idea of space is innate in us, that we are in a position to frame universal propositions in geometry, which once thought are valid always; if it were at all intelligible without any such hypothesis how the idea of a particular combination of spatial points of relation could arise in us purely through external impressions, still, in presence of such an idea, the immediate apprehension of the universal truth contained in those relations, which is the service of intuition, would be not more inexplicable (though it would be equally inexplicable) and not less possible than if those same points of relation could only be brought into our consciousness by the help of an innate mode of reaction and spontaneity in the mind itself.[27]

At the core of Lotze's interest here was the idea that our knowledge of space in geometry is based on the self-evidence of the postulates of geometry which is achieved through the immediate apprehension of spatial relations within the intuition (*Anschauung*). The cause of these relations can also be empirical, but they assume general validity, once we immediately

[27] R. H. Lotze, *System der Philosophie. Logik. Drei Bücher vom Denken, vom Untersuchen und vom Erkennen* (Leipzig: S. Hirzel, 1874), 582; engl. trans., 515–6.

grasp their truth through intuition. In other words, it is not relevant what gives rise to this immediate knowledge in us. Lotze employed the term 'a priori' in a narrow sense, by indicating as a priori the knowledge that does not arise from a process of induction or addition of particular examples, but is considered as a truth of general validity that precedes the particular example, precisely as the determining rules. As Lotze wrote:

> I therefore reserve the question of the *a priori*, in the sense of the innate character of spatial Intuition, with any further question which may arise out of it, for the Metaphysic, and apply the term *a priori* to spatial intuitions in a restricted sense only, viz. to indicate that they are not derived by a process of induction or summation from particular instances which exhibit them, but are thought to begin with as truths of universal validity, and are thus prior to the particular instances in the sense of being rules by which they are determined.[28]

Stating that our spatial knowledge is a priori, Lotze did not mean that this latter is innate or simply precedes our actual knowledge of experience, which would suggest a *chronological* a priori, but that it is *logically* (and not *temporally*) prior to experience.

Intuition is in not a process (*Verfahren*). Unlike discursive thought, it does not arise from the connection of multiple acts. With respect to its content, intuition works as a passive receptivity and, yet, so rapidly that it is not even possible to distinguish the different stages of its development. Although it is possible to outline the course of the representations that result in intuition, any further psychological analysis of its final phase, i.e. the immediate consciousness of the necessary truth (entailed in the terms of the relation integrally given), is impossible. Lotze maintained:

[28] *Ibid.*, 582–83; engl. trans., 516.

> How this final step is accomplished, the immediate apprehension of the necessary truth which is implied when once all the members of the relation are completely given, is a point upon which certainly at present, and in my judgment no less certainly for ever, any further psychological analysis is impossible. It is only in this sense of absolutely immediate apprehension that I have here employed the term intuition, and it leads me to a further observation as to the meaning of the expression *a priori* as applied by us to intuition.[29]

Lotze employed the term 'intuition' only to mean an absolutely immediate knowledge. The immediacy of intuition provides us an a priori knowledge which is due neither to induction nor to the mere collection of particular examples, but is rather a truth of general validity and, therefore, like the determining rules, prior to these examples.

Affirming the logical and non-temporal primacy of our a priori knowledge, Lotze established the distinction between the thought as a psychic process and the objective content of thought. Logic is not interested in the conditions that give rise to the thought as psychic process; the meaning (*Bedeutung*) of logical forms lies in the sense (*Sinn*) of the connections with which the content of our world of representation has to comply.[30] Besides opposing to Kantian innatism of the pure forms of intuition, here Lotze also criticized Fries, who, through his psychologistic interpretation of Kant's transcendental aesthetics, had considered our a priori knowledge as *temporally* prior to experience and, more generally, as the human innate psychic structure. According to Fries, only this sense of a priori could provide knowledge with universal and necessary validity. Lotze considered our a priori knowledge as the content of thought that is grasped in intuition and, consequently, not as *temporally* prior to any possible experience: once it is recognized as self-evident, it actually becomes *logically* prior to experience.

[29] *Ibid.*, 581–82, § 357; engl. trans., 515.

[30] See: *ibid.*, 530–32, § 332.

2. Physiological and psychological studies in the first half of the 19th century

Between the 1830s and 1840s, philosophers, psychologists and other researchers had questioned intensively the scientific status of psychology. In these years, mathematics and natural sciences—physics, physiology and chemistry—had experienced a rapid development. Philosophy, understood as epistemology, and natural sciences had addressed the problem of mental phenomena; the human sensory-perceptive activity was no more considered as a purely philosophical problem and gradually became of interest to the physiological research. Between the early 1800s and 1874—the year of publication of both *Gründzuge der physiologischen Psychologie* by Wilhelm Wundt and *Psychologie vom empirischen Standpunkt* by Franz Brentano—the main debate focused on whether human mental life could be reduced to merely physical events and, as in consequence, whether it could be scientifically explained on the basis of experimental data alone. Both the question on the reduction of mental life to physiology and that regarding what kind of science can be used legitimately in psychological research were fundamental for the development of scientific psychology. The objective of the present chapter is the analysis of the development of psychology between 1802, year of publication of *Rapports du physique et du moral de l'homme* by Pierre Jean Georges Cabanis, and 1852, year of publication of *Medicinische Psychologie oder Physiologie der Seele* by Rudolph Hermann Lotze.

2.1. The study of the nervous system

Between the 1820s and 1850s, Germany and France were in the forefront of scientific research, especially into physiology, physics and chemistry. An important example was

Justus von Liebig's chemical research: the chemical laboratory that he directed in Giessen is the first case of modern teamwork research unit. We should also mention Alexander von Humboldt and Christian Gottfried Ehrenberg's naturalistic research in geography, botany and zoology, and Heinrich and Gustav Rose's research in chemistry and mineralogy. Of special interest for the present study is to pass in review the state of the physiological research at that time. The point is that Lotze extensively adopted it as a scientific support for his psychological conceptions, such as that of "local signs" on which we will focus later. At that time, the physiological research, which mainly focused on the problem of the inexplicable relationship between mind and body as well as on a more accurate definition of phenomena in the psychic sphere, used to tackle the issues of sensation, perception and brain localization of mental functions. The great number of experiments carried out in this way resulted in the formulation of the concept of 'specific sensory energy' which, by highlighting the nervous activity, circumscribes parts of the sensory-perceptive process that could not be explained on the basis of a mere physiological foundation and could therefore be attributed to the existence of a specific psychic activity. To be sure, it is not possible to reduce the physiological research of those years to a single dominant attitude. In fact, alongside reductionist positions such as those of Johannes Petrus Müller and somehow also of Jean Pierre Marie Flourens, there were other authors, such as Hermann von Helmholtz and Gustav Theodor Fechner, who clearly opposed reductionist materialism, and authors such as Ernst Heinrich Weber who were not interested in the evaluation but only in the definition of the set of experimental data and scientific explanations that can be actually provided.

Furthermore, Franz Joseph Gall and Johann Gaspar Spurzheim's phrenology tried to provide a mechanical explanation of psychic phenomena through the theory of localization. According to the theory of brain localization of mental functions, in the brain every idea has its own collocation and this is what allows consciousness to emerge. Apparently,

phrenologists intended to overcome the Cartesian dualism between mind and body, by showing that mind is nothing else than a function performed by the body, in the hope to solve the problem of the mind. Actually, since phrenologists were not able to explain how a purely physical movement could concretely give rise to intensive states of consciousness, they shifted the problem of the mind, with all the questions related to the psychological tradition—memory, will, emotions—to the brain. The dualism remained, in fact, unsolved.

The physiologists of the nervous system, such as Marie-Jean-Pierre Flourens and Johannes Peter Müller, definitely opposed phrenologists, already discredited in the scientific circles, refuting their theses on the role of the cerebellum and extending their own scientific research to nerves, considered as the real path leading to brain. Among other things, phrenologists argued that cerebellum was the organ in which sexual inclination was located. This thesis, however, was experimentally refuted by Combette and Flourens, who demonstrated that cerebellum's role was basically that of coordinating and regulating all the partial movements as regular and determined movements of the whole body.

The Scottish physiologist and physician Charles Bell (1774–1842) was the first who distinguished the sensory function of dorsal spinal nerve roots from the motor function of ventral roots (Bell-Magendie law) and who theorized the doctrine of specific sensory energies in 1811.[1] In his 1853 work *De la vie et de l'intelligence*, Flourens accounted for the anatomical distinction of nerves discovered by Bell and the problem of specific sensory energies, which Müller would later present more systematically, as well as for the question of the cerebral localization of mental functions. With regard to the latter aspect, between 1820

[1] Bell published extensive studies of the nervous system in 1811. These studies initially circulated privately in his book *An Idea of a New Anatomy of the Brain* (Bell C, Shaw A (November 1868). "Reprint of the "Idea of a New Anatomy of the Brain"". *J Anat Physiol.* 3 (Pt 1): 147–82).

and 1840 Flourens carried out a series of experiments, partially embracing the experimental and observational results presented by Luigi Rolando in Italy.[2]

In brief, Flourens managed to determine experimentally the various functions of the brain as well as of parts of the nervous system. Moreover, he discovered that the nervous system operates like a compact and organized whole and single system. Despite the fact that mental functions are located in different and specific parts of the brain and the nervous system, even when one of these parts is removed, the single function does not disappear but is taken over by the rest of the system. This notwithstanding, all the mental functions have undoubtedly their own physical and physiological location within the central and peripheral nervous system. In this sense, Flourens became the main exponent of an essential physiological reductionism which, however, did not coincide with Gall's and Spurzheim's phrenological theses—we could recall the well-known debate about the cerebellum's functions—that were not accepted in the scientific world. Whereas Bell-Magendie law exclusively focused on sensations and movement, Flourens questioned higher mental functions: perception and volition. In 1822 through his experiments he detected four constitutive parts of the brain in which he could locate distinct functions: the *medulla oblongata* (principle of the respiratory mechanism), *corpora quadrigemina* (principle of vision), the *cerebellum* (coordination of locomotory movements) and the proper *cerebrum*, the lobes of brain hemispheres, the site of perceptions and volition: intelligence. The bodily movement production is located—according to the law of Bell-Magendie—in the spinal cord and its nerves, but balance as well

[2] In 1809 the Italian anatomist Luigi Rolando published his *Saggio sopra la vera struttura del cervello dell'uomo e degli animali e sopra le funzioni del sistema nervoso*. He provided important considerations on cerebral hemispheres—*fissure of Rolando* bears his name—as well as on the nervous system. We should also remember the Italian physicist Felice Fontana, who presented important results on human eye.

as the control of different movements within the overall motion are located in the cerebellum. The cerebrum (lobes and hemispheres) was the *exclusive seat* of intelligence (perception and volition), as discovered by Flourens thanks to his experiments on chickens. Flourens noticed that, by depriving the animal of a single lobe, this lost the ability to see with the eye of the opposite side but its intelligence was preserved.[3] When both lobes were removed, the animal completely lost its ability to feel (sight, hearing, instincts, etc...) as well as its intelligence (perception, will and spontaneous action). According to Flourens, this meant that the cerebrum is the only seat of intelligence. Indeed, there is no intelligence, once the whole brain is removed. However, his interpretation of the experimental data did not take into account the fact that, although intelligence disappears once the cerebrum is removed, this does not necessarily mean that the cerebrum is the exclusive seat of this mental function. Cerebrum might be an important factor for the development of our consciousness, without being its only and exclusive seat. In the years following the publication of Flourens' outcomes, other researchers and scientists discussed and questioned his results. Interpreting his results in the sense of a rigid and clear localization, Flourens proposed a distinction between sensation and perception based on the distinction of the organs that host these psychic functions. Removing corpora quadrigemina, we lose the sense of sight; if we remove one cerebral lobe, our sensation remains but not our perception. Basing on the differentiation between sensorial facts and cerebral facts, he distinguishes sensation from perception, claiming that this should suggest a substantial autonomy of different organs which corresponds to an autonomy of their functions. Such a fragmented and dissected conception of the nervous system will be criticized by scientists after Flourens.

[3] It is difficult to understand what Flourens meant by intelligence here—the ability to perceive the surrounding world or the will.

Another fundamental contribution is that of Johannes Müller who, in his *Physiologie des Gesichtssinnes* (1826) and his great systematic work *Handbuch der Physiologie des Menschen* (1833–1840), provided more scientificity to physiological studies. Focusing on the problem of the interaction between physiological and psychological levels, he dealt with the question of what method physiological research should adopt, but also with the question of which is the epistemological meaning and scope of the physiological research. In his 1826 work, Müller questioned the origin of self-consciousness, stating that this latter is always and only knowledge of the ego's inner changes. From the very first moment of their life, the person perceives her body as something extended and occupying space and radically different from what is outside. It is the education of our senses that leads us to identify external causes of our internal changes and even to consider our internal changes as an external reality in front of us. Dealing with the fundamental principle of physiological research, Müller theorized the existence of specific sensory energies that are not immanent to external things, but rather to the nerves that always activate and respond in the same way to external stimuli. The notion of "specific sensory energy" (*Sinnesenergien*) means that a nerve fiber, subject to external stimuli, no matter how different these may be, always responds in the same way, and this is precisely what constitutes its specificity or *quality*.[4]

Our nervous system is not a purely passive mechanism that records and duplicates the outer world into us. Rather, it is an active system that responds to the external impulses of the specific energies of luminous, dark, etc. If we limit ourselves to the sense of sight, these energies do not belong to the outer world, but to the nerve that releases them, when it is

[4] This concept is close to that of *Irritabilität* or *Reizbarkeit* introduced by Albrecht von Haller and widely embraced in the medical and physiological world between the end of the 18th and the beginning of the 19th century.

subject to a stimulus. This position gives rise to a further problem. If the specific sensory energies belong to the structure of the nervous system, why does the subject attribute them to the outer world, considering them as objects provided with a spatial dimension?

Müller answered this problem in his considerations on representation. He sets out that our sensory process is always accompanied by representation which highlights the existence of states that are not purely sensory. The visual sensation, for example, works as follows. A stimulus from outside activates the sensorial energies of retinal nerves; alongside this sensory activity there is the representative activity or imagination (*Vorstellung*) regarding the object of the sensation. The resulting representation takes the place of the content of sensation, that is, the specific sensorial energies, and transforms these latter into external objects provided with spatial extension. In consequence, Müller distinguished the sensory activity taking place in nerves, whose specific content consists of specific sensorial energies, and the representative activity that locates the thought object in a spatial dimension outside our body. This is, according to Müller, the origin of our representation of external objects. In his very first months of life, the child already experiences the representation of the resistance of parts of the body between each other as well as the representation of the resistance of an outer world against the body: this is how we achieve a representation of the external world causing our sensations.

This problem led Müller to discuss that of the origin of our idea of space. The primary fact of which we are aware as human beings is the movement of our muscles within our body, which occupies a certain space. Examining the sensory structures of sight and touch and basing on Treviranus' thesis about the constitution of the retina, Müller stated that this latter is a set of nerve-endings and that nerve-fibers spread over the body-surface and, moreover, that nerves' ability to sense their own spreading is the origin of our notion of space. Basing on our corporeity and extension, we consider external bodies as extensive, too. The notion of

space—which is originally related to specific sensorial energies and is, therefore, a sensorial fact immanent to our nervous structure—is then projected outwards, becoming a representation of space. The representation of space is not something innate at a sensory level, but it gradually arises through experience. It is important to explain how we transfer the notion of space from the world inside us—from our nerves and their sensation of spreading—to the world outside us.

Our body is always present within our visual field. In almost all our visual impressions it occupies a part of the visual field, so that its presence is a constant in the dynamics of our vision and, thanks to its constant presence, we represent our body as opposed to the external bodies. Visual or tactile sensations are so strong and convincing that we confuse these specific sensory energies with objects of the outer world. The sense of representation lies in this confusion or transfer. Without the intervention of the representation, the nerves that give rise to human sensation would only sense their own inner affections. The simple comparison of the sensory fact with the representative fact led Müller to introduce the problem of the mind.

Müller's conclusion was that human knowledge is completely constituted of physiological and intellectual structures that cannot be reduced to a physiological level. In his *Handbuch der Physiologie des Menschen* (1833–40) he paid constant attention to the physiological research and observation as well as to those elements that denote a relation between the physiological aspect, which he called principle of life ("*Lebensprinzip*"), and the psychic manifestations, which he called principle of mind ("*Prinzip der Seele*"). The features of this relation between body and mind—and in this respect Müller was very clear—are absolutely inconceivable (*unbegreiflich*). Müller stated:

> But we cannot lose sight of the fact, that the brain is an aggregate of numerous differently organised parts, and in this respect a highly complicated piece of mechanism; while the mind exists in a latent state, in the germ, independently of this mechanism, although incapable without it of manifesting itself or acting upon the body. The manner in which the mind makes use of this highly complicated and delicate piece of mechanism, is certainly inconceivable.[5]

Before reviewing the positions of authors, such as E. H. Weber and G. T. Fechner, who were certainly important to the development of Lotze's conception of psychology, we would like to dwell briefly on the foundation of Flourens and Müller's theses as well as on the way in which they were questioned by some later authors.

As F. A. Lange clearly and precisely pointed out in *Geschichte des Materialismus*, although Flourens and Müller's physiology of the nervous system greatly contrasted with phrenology, which had no recognition in the scientific world, both authors nevertheless upheld a theory of centralization.[6] According to Flourens and Müller, higher mental functions, such as thought and will, had an exclusively cerebral localization. It deserves notice that Flourens' experiments mentioned above seemed to lead to these considerations which, however, were not confirmed by the experiments of Oscar Hertwig and François Achille Longet, both mentioned by Lotze in his *Medicinische Psychologie*.

These experiments showed that, if we remove the upper part of the hemisphere of a pigeon's brain, the animal loses its hearing but after a lapse of time immediately recovers it. This experiment discredited the claimed empirical evidence of the conception of the *exclusive*

[5] J. P. Müller, *Handbuch der Physiologie des Menschen*, 2 vol. (Koblenz: Verlag von J. Hölscher, 1840), 559; engl. trans., *Elements of Physiology*, W. Baly (trans.), (London: Taylor and Walton, 1842), 2 vol., 1388.

[6] See: F. A. Lange, *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart* (Iserlohn: Verlag von J. Baedeker, 1875), II, 332–75; english trans., *The History of Materialism and Criticism of Its Importance*, Ernest Chester Thomas (trans.), (London: Trübner & Company, 1877–1881), III, 111–61.

anatomical localization of psychic faculties. The recovery of temporarily lost faculties made it clear that it is impossible to exclusively localize the specific faculties in specific areas of the brain. Furthermore, this suggested that the brain was not the only seat of mental functions, albeit a necessary and fundamental *factor* for their realization.

Later studies on the brain made by Theodor Hermann Meynert, Julius Eduard Hitzig, Carl Wilhelm Hermann Nothnagel and David Ferrier conceived the brain not as the seat of higher mental functions, but as the organ that coordinates and combines sensations and movements.[7] The experiments of the above-mentioned authors reject a brain localization of mental functions because, when a certain part of the brain, which that is supposed to be the seat of a certain mental function, is ablated, we do not lose this function (as a close localization would rather suggest), but it is preserved by our nervous system through alternative paths. This proves that our nervous system has to be considered as a whole.

2.2. Hermann Lotze on phrenology and the question of the location of the mind

Lotze addressed the question of the validity of phrenological conception both in *Medicinische Psychologie* and in *Mikrokosmos*, highlighting their theoretical difficulties without, however, ignoring the fact that some parts of the empirical material of their analysis may be true.[8] Phrenology assigns multiple functions to the brain and searches for special brain organs that

[7] See above all: T. H. Meynert: "Vom Gehirn der Säugetiere", in *Handbuch der Lehre von den Geweben des Menschen und der Tiere*, Salomon Stricker (ed.), (Leipzig: Verlag von Wilhelm Engelmann, 1871), 694f.

[8] See: R. H. Lotze, *Medicinische Psychologie oder Physiologie der Seele* (Leipzig: Weidmann'sche Buchhandlung, 1852), 106–15; and *Mikrokosmos. Ideen zur Naturgeschichte und Geschichte der Menschheit. Versuch einer Anthropologie*, N. Milkov (ed.), (Hamburg: Felix Meiner Verlag, 2017), I, 353–85; english trans., *Microcosmus: An Essay Concerning Man and his Relation to the World*, E. Hamilton and E. E. Constance Jones (trans.), (Edinburgh: Clark, 1885), I, 316–43.

might be the anatomical *seat* of complex mental operations. According to Lotze, the division of brain into special regions at the service of different mental activities can be hardly upheld and is theoretically problematic. First of all, it cannot explain the interaction performed by the different mind activities on each other. In other words, if we assume that the brain is divided into special organs for the different activities of the mind, then we can no longer account for the overall effect and unity, which is the main feature of human psychic life. Moreover, as Lotze continued, it would also be difficult to implement the theses of phrenology, because we should presuppose a researcher provided with a perfect knowledge about every nuance of the individual character, precisely since the cause of the character lies in the physical organ that produces it. This hypothesis clearly contradicts the actual formation of the character, because it is determined not only by the body conformation but also by various external, environmental conditions, in one word, by experience. Ultimately, phrenology erroneously considers experience, life events and illnesses as direct consequences of a single and unique cause: the brain conformation.

The fundamental question of phrenology, analysed by Lotze both in *Medicinische Psychologie* and in *Mikrokosmos*, is whether the mind has its place in the corporeal and spatial world. Obviously, if we assume the philosophical conception of space as an idea (*Idealität des Raumes*), we do not need to raise the question of the seat of what is trans-sensual (*Sitz des Übersinnlichen*) within an extended world. This metaphysical point of view on reality, in accordance with Lotze's mentalism—which will be discussed later—,is only a point of arrival for our knowledge, which still cannot be practically used by science. The science dealing with the psycho-physical mechanism cannot be based on such a monist perspective: it must assume mind–body dualism and grasp its relations, combinations and proportions, without claiming for an exhaustive definition of its meaning. As Lotze wrote:

> es würde unabsehbare Schwierigkeiten verursacht haben, philosophische Theorien über die Idealität des Raumes hier zu besprechen, deren Berücksichtigung natürlich die Frage nach einem Sitz des Übersinnlichen in einer räumlichen Welt gänzlich umgestaltet haben würde.[9]

Lotze dealt with the seat of the mind in the brain in the tenth paragraph of *Medicinische Psychologie*. Analysing this problem means questioning also the form of the interaction between body and mind, since it entails the localization of every single part of the brain, whose changes of state (*Zustandsänderungen*) are immediately (*unmittelbar*) related to the mind's changes of state. According to Lotze, the seat of the mind was not necessarily the anatomical point where all nerve fibers converge; in other words, here he criticized the theory according to which brain is the only seat of the mind. He wrote in this connection:

> wie unvollkommen auch noch unsere Kenntnisse über die feinere Structur der Centralorgane sind, so begünstigt doch das, was wir wissen, sehr wenig die Annahme eines einzigen örtlichen Mittelpunktes, in welchem alle Nervenfäden, oder doch mindestens alle wesentlich verschiedenen Gruppen derselben durch einzelne Verbindungsfaden sich sammelten. Dieser Mangel eines Schlusspunktes für das ganze Nervengewebe, noch fühlbarer gemacht durch die Anatomie der niederen Tiere, lässt unsere Vorstellung von einem bestimmten Sitz der Seele unsicher werden.[10]

Analyzing the relation between stimulus and impression (*Reiz-Eindruck*), Lotze stated that the stimulus from the outer world is recorded by nerves as an impression, which from the surface of human body runs up to the seat of the mind—producing in this way qualitative and psychical final states (*Endzustände*) on the basis of physical states—through all the

[9] R. H. Lotze, *Kleine Schriften*, David Peipers (ed.), 4 vols. (Leipzig: Verlag von S. Hirzel, 1885–91), 3 vol., 8.

[10] R. H. Lotze, *Medicinische Psychologie oder Physiologie der Seele* (Leipzig: Weidmann'sche Buchhandlung, 1852), 116.

components of our body: bones, muscles, blood and parenchymatous organs. According to Lotze, it is not necessary to theorize that all nerve fibers necessarily converge to a single core point, which would correspond to the only and fixed seat of the mind, similarly to a mathematical point. In his opinion, it is much more likely that the mind is located in the amorphous Parenchyma (*ungeformtes Parenchym*) or in the cellular masses (*Zellenmassen*), that is, between the nerve fibres.

In such non-centralistic, mobile and dynamic conception of the mind, the role of the brain is far from being of minor importance: the entirety of the weaves and crossings of nerve fibers located in the brain are supposed to produce, through the interaction of various physical nervous stimulations, those ultimate qualitative states that constitute the material on which the mind activity is based.[11]

The rejection of a fixed and exclusive place of the mind leads to the idea that this latter is constantly in direct and immediate contact (*unmittelbare Berührung*) with the stimulated nerve endings, by whose influence it is directly affected. This rejection also implies a denial of any possible demonstration of the existence of a central point to which all these endings would converge. Only a dynamic mind could operate in this way.

Lotze expressed his own conception of the mind employing an apt metaphor that contrasts with the old idea proposed by phrenologists, according to whom the mind waits for the nervous impressions. On the contrary, Lotze considered the mind to be dynamic and in constant search for its working material. In Lotze's words:

[11] See: *ibid.*, 121.

> Sie [die Seele] soll nicht ruhig sitzend zuwarten, bis der Eindruck an sie gelange, sondern sie soll ihm entgegeneilen und überall an Ort und Stelle, nämlich an den centralen Enden der jedesmal erregten Fasern die Eindrücke aufsammeln, die ihr dort dargeboten werden.[12]

2.3. Three scientific psychologists

2.3.1. Ernst Heinrich Weber

Müller's research raised the question of the connection and distinction between a physiological and a psychological level in the sensory process. The work of the physiologist Ernst Heinrich Weber also contributed to this debate. Müller's conception of the specific energies of nerves as *qualities* that these latter produce was embraced by Weber and then—as we will see later—by Lotze. The figure of E. H. Weber was important for the formation of R. H. Lotze's scientific thought. Thanks to his correspondence with Ernst Friedrich Apelt, we know that Lotze attended the classes (precisely eight courses) of the anatomist and physiologist Weber, which included experiments on the sensory process.[13] These courses allowed Lotze to understand in depth the concept of mechanism in natural sciences. This concept was instrumental to provide an order to medical science, but also to identify the limits of the claims of the mechanistic perspective. This project resulted in Lotze's first doctoral dissertation in Medicine *De futurae biologiae principiis philosophicis,* that he

[12] *Ibidem*.

[13] See: W. R. Woodward, *Hermann Lotze. An Intellectual Biography* (Cambridge University Press, 2015), 46–47.

defended in 1838.[14] In fact, with regard to 'nerve qualities', we initially (*ursprünglich*) perceive only *qualities* with different *intensities* and then we assume the existence of a mind activity which disposes all the perceived qualities within a spatial order. Weber stated that:

> wir durch die reine Empfindung ursprünglich gar nichts über den Ort wissen, wo auf den die Empfindung vermittelnden Nerven eingewirkt wird, und dass alle Empfindungen ursprünglich nur unser Bewusstsein anregende Zustände sind, welche dem Grade und der Qualität nach verschieden sein können, aber unmittelbar keine räumlichen Verhältnisse zu unserem Bewusstsein bringen, sondern nur mittelbar, durch die Anregung einer Tätigkeit unserer Seele, mittelst deren wir uns die Empfindungen vorstellen und in Zusammenhang bringen, und zu welcher wir durch eine angeborene Seelenanlage oder Seelenkraft angetrieben werden.[15]

In his contribution, published in Rudolph Wagner's *Handwörterbuch der Physiologie* under the title of *Über Tastsinn und Gemeingefühl* (1846), Weber examined tactile and acoustic sensations and tackled the problem of common sensation (*Gemeingefühl*) which is

[14] See: R. Pester, *Hermann Lotze. Wege seines Denkens und Forschens. Ein Kapitel deutscher Philosophie- und Wissenschaftsgeschichte im 19. Jahrhundert* (Würzburg: Königshausen & Neumann, 1997), 52–53. In his interpretation Pester stated that Lotze's development of the concept of mechanism was strongly influenced not only by Weber, but also by Marshall Hall's theory of involuntary reflexes movement. As we will see later, this theory played an important role in Lotze's theory of local signs (*Localzeichentheorie*). Lotze mentioned the concept of mechanism already in a letter to Apelt dated 18 February 1837. (See on this: W. Woodward, *op. cit.*, 54–55n). Lotze expressed a kind of exasperation towards Weber's classes, because they focused too much on the subject of mechanism and did not consider that of *dynamis* which was essential to Lotze. The dual mechanism–dynamis model will be central in his 1838 philosophical dissertation.

[15] E. H. Weber, "Der Tastsinn und das Gemeingefühl", in *Handwörterbuch der Physiologie mit Rücksicht auf physiologische Pathologie*, Rudolph Wagner (ed.), (Braunschweig: Druck und Verlag von Friedr. Vieweg und Sohn, 1846), 3rd vol., 2, 486.

the general sense of ‘self’ that the body experiences in its relation with the external world as well as with its internal organs. The common sensation is related to the notion of sensory circles (*Empfindungskreise*) which is the root of our sense of location (*Ortssinns*). This local sense consists in the possibility that two sensations, albeit equal, are perceived as different simply because they are stimulated in different places of our body. This is possible because our skin is divided into areas that Weber called sensory circles which become larger when sensibility (*Ortsempfindlichkeit*) is lower, and smaller when sensibility is higher. If two stimuli are addressed to the same sensory circle, we will sense only one on our skin with a certain intensity; whereas if stimuli apply to two different sensory circles, separated by one or more unstimulated circles, we will have different sensations and we will be even in a position to locate them. Examining the problem of the sensations caused by different stimuli, Weber discovered the irregular spread of nerve fibers over the surface of the body. For example, there are more nerve fibers on the tongue than on the central part of the arm and leg. This unequal distribution of nerve fibers led him to determine a “limit (*die Schwelle*)” of the nervous system’s ability to distinguish sensations.

Through further experiments on muscle sensation, sight and hearing, Weber realized that the possibility of distinguishing two sensations does not depend on the absolute size of the stimulus, but on the difference of increase between the second and the first stimulus. There is a relation of proportionality between two stimuli in succession, so that we can detect the minimum perceptible difference of one sensation from the other. Weber’s law stated that, in order to produce a different sensation, the minimum level of increase required by the second stimulus with respect to the first one can be determined experimentally for each kind of stimulus (tactile, visual, acoustic, etc.). In this way we can determine the exact limit that each new stimulus must overcome with respect to the previous one. This limit also changes from person to person.

Already in his 1846 essay, Weber listed the fundamental points of human perceptual process:

i. the movements in the bodies around us that resonate within our sense organs;

ii. the movements of our nerve fibers caused by the movements mentioned above, which are nevertheless of a different kind;

iii. the changes in our consciousness which are stimulated by nerve movements and that we call sensations;

iv. the representation of sensations through the categories of time, space and number;

v. the abstract concepts of the mentioned categories as well as of all the other categories, and the concepts resulting from their composition.[16]

According to Weber, our spatial sense (*Raumsinn*) is a common sensation (*Gemeingefühl*) or general sense (*Generalsinn*), because our perception of space (*Raumvorstellung*) is not merely based on the nervous activity nor on a specific class of sensations, but is a peculiar disposition and order of the optical and tactile nerves. The specific qualities provided by the stimulated nerve fibers are not sufficient to constitute the perception of space. Be that as it may, Weber considered necessary to assume a psychic activity that, starting from the physiological material, makes such a perception (*Raumvorstellung*) possible. Our idea of space as a disposition or order—developed through our mental activity—of the specific qualities provided by nerves is not something given (*ursprünglich*). Space is the product of a physiological and psychic mediation. According to Weber, the anatomical modifications of

[16] E. H. Weber, *op. cit.*, 487.

nerves do not directly cause the perception of space, because there is always a psychic element of mediation (*psychisches Zwischenglied*) that organizes the specific qualities of the nerves.[17]

Ultimately, it can be said that Weber's investigations provided a series of methodological procedures aimed at investigating physiologically unexplained types of behaviors rather than the physiological mechanisms of sensation. Weber considered it possible to understand the relations between the mind quantities as a whole, without employing external units of measurement or knowing the absolute difference between the different quantities. Moreover, Weber's physiological research is of prominent philosophical importance, because it investigates sensation, the perception of space, the concept formation and the conceptual outline of the sensory self-consciousness, that is, the common sensation (*Gemeingefühl*).[18]

Weber's research on the localization of sensory stimuli through specific sensory circles was important to the elaboration of Lotze's theory of local signs. The fundamental idea of his research consisted in considering the notion of space not as something innate or given (*ursprünglich*) but as something that is acquired through the relation with the environment. This suggests the existence of a causal link between the behavior and the structure of the nervous system and perception of space.[19]

---

[17] For Carl Stumpf's criticism of the Weberian theory of the Raumvorstellung see C. Stumpf: *Über den psychologischen Ursprung der Raumvorstellung* (Leipzig: Verlag von S. Hirzel, 1873), 84–86.

[18] On the concept of common sensation and its subsequent reception see: Riccardo Martinelli: *Misurare l'anima. Filosofia e psicofisica da Kant a Carnap* (Macerata: Quodlibet, 1999), 35f; Stefano Poggi: *I sistemi dell'esperienza. Psicologia, logica e teoria della scienza da Kant a Wundt* (Bologna: Il Mulino, 1977), 519–29.

[19] See: C. Stumpf, *op. cit.*, 78.

2.3.2. Gustav Theodor Fechner

Weber's investigations were of great importance to Gustav Theodor Fechner, who developed psychophysics as an autonomous discipline. Fechner, in his turn, greatly influenced Lotze's education. W. Woodward portrayed him as Lotze's "closest advisor".[20] Both Lotze and Fechner were part of the 'Friday circle', which included another important mentor of Lotze, Christian Hermann Weiße. The debates between Lotze and Fechner took place mainly in this circle. As if in support of this note, Lotze wrote in a letter: "I have recently had a conversation with Fechner which entertained me very much".[21] Lotze attended Fechner's lectures on optics, acoustics and the theory of heat; these lectures taught to Lotze to understand

> die Bedeutung des quantitativen Experiments, demonstrierte die Notwendigkeit der messenden Naturwissenschaft und trainierte die mathematische Verarbeitung ihrer Ergebnisse.[22]

Of course, there was also theoretical disagreements between them. During the 1850s and 1860s, they discussed philosophical and psychological questions, such as that of measurement in psychology, expressing diverging positions.

Gustav Theodor Fechner, with a constant attention to Weber's studies, dealt with the problem of the measurement of sensation in two works: *Zend-Avesta* (1851) and *Elements of Psychophysics* (1860). The central thesis of Fechner's psychophysics affirmed that it is not possible to *directly* measure sensation in its absolute value, but it is possible to measure it

[20] W. Woodward, *op. cit.*, 55.

[21] *Ibid.*, 56.

[22] R. Pester, *op. cit.*, 28.

indirectly on the basis of the external stimulus by which it is caused.[23] Eventually, Fechner came to the conclusion that the sensation is proportional to the logarithm of the stimulus. In 1851, in *Zend-Avesta*, Fechner explained the principle of his mathematical psychology: the intensity of the psychic activity increases logarithmically according to the intensity of the physical stimulus, whether it be an optical or an acoustic stimulus.

In order to grasp the core of Fechner's psychophysics—i.e. the idea that it is possible to *indirectly* measure the sensation by measuring the stimulus, given that the stimulus has a precise logarithmic relation with the sensation to which it gives rise—it is necessary to consider the philosophical background of such a formula of measurement (*Maßprinzip*). To this purpose, we have to consider Fechner's definition of psychophysics:

> Unter Psychophysik soll hier eine exakte Lehre von den funktionellen oder Abhängigkeitsbeziehungen zwischen Körper und Seele, allgemeiner zwischen körperlicher und geistiger, physischer und psychischer, Welt verstanden werden.[24]

The functional relationship between body and mind reveals that there is no ontological difference between them; body and mind are simply two aspects of one and the same thing. The theoretical foundation of Fechner's metaphysics lies in Spinoza's monism, which Fechner often and explicitly defined as identity conception (*Identitätansicht*).[25] In Fechner's words:

---

[23] See: G. T. Fechner, *Elemente der Psychophysik*, 2 vol. (Leipzig: Druck und Verlag von Breitkopf und Hartel, 1860), 54f., 60f.

[24] *Ibid.*, 8.

[25] On the importance of Spinoza's monism for Fechner see: R. Martinelli, *op. cit.*, 41.

> Körper und Geist oder Leib und Seele oder Materielles und Ideelles oder Physisches und Psychisches (diese Gegensätze hier im weitesten Sinne als gleichgeltend gebraucht), sind nicht im letzten Grund und Wesen, sondern nur nach dem Standpunkt der Auffassung oder Betrachtung verschieden. Was sich selbst auf innerem Standpunkt als geistig, psychisch erscheint, vermag einem Gegenüberstehenden vermöge dessen dagegen äußern Standpunkt nur in anderer Form, welche eben die des leiblich materiellen Ausdrucks ist, zu erscheinen. Die Verschiedenheit der Erscheinung hängt an der Verschiedenheit des Standpunkts der Betrachtung und der darauf Stehenden. Insofern hat dasselbe Wesen zwei Seiten, eine geistige, psychische, sofern es sich selbst, eine materielle, leibliche, sofern es einem andern als sich selbst in anderer Form zu erscheinen vermag, nicht aber haften etwa Körper und Geist oder Leib und Seele als zwei grundwesentlich verschiedene Wesen an einander.[26]

This passage allows us to understand more in depth two central aspects of Fechner's metaphysics: its peculiar perspectivism and the way in which his identity conception is to be understood. Fechenr's perspectivism underlined how the reality that we conceive or interpret is always determined by our own point of view or perspective. Mind and body do not differ as to their essence: metaphysically speaking, they are the same thing. It is the knowing subject's view that understands them as two different aspects of that same thing. Everything is determined by the point of view from which we conceive the problem of mind-body relationship. If we adopt an inner point of view, this fundamentally unitary essence manifests its mental aspect, whereas, if we assume an external point of view, it will manifests its material side. Fechner further wrote:

> Die Naturwissenschaft stellt sich consequent auf den äusseren Standpunkt der Betrachtung der Dinge, die Wissenschaft vom Geiste auf den inneren; die Ansichten des Lebens fussen auf dem Wechsel der

[26] G. T. Fechner, *Zend-Avesta oder über die Dinge des Himmels und des Jenseits. Vom Standpunkt der Naturbetrachtung* (Leipzig: Leopold Voss, 1851), 2 vols, 2 vol., 321–22.

> Standpunkte, die Naturphilosophie auf der Identität dessen, was doppelt auf doppeltem Standpunkte erscheint; eine Lehre von den Beziehungen zwischen Geist und Körper wird die Beziehungen beider Erscheinungsweisen des Einen zu verfolgen haben.[27]

Alongside Spinoza, another important philosopher for Fechner's thought was Leibniz, whose *Monadology*, proposition 57, seems to have been another inspiring source of Fechner's perspectivism.[28] In fact, Fechner's perspectivism cannot be considered separately from his identity conception, since they are two converging conceptual elements that support each other. The problem of unity cannot be understood without the support of perspectivism and, vice versa, it is not possible to enucleate the question of perspectivism without considering the metaphysical unity at which it aims.

The metaphysical unity of a given object—in this case, of the mind–body relation—cannot be known in itself by the subject, without considering the particular perspective of the knowing subject with respect to that object. This set of perspectives, which allows the object to show one side or another, does not undermine the metaphysical unity of the object. Such a unity exists, but, in his constant and irreducible partiality, the subject grasps only a part of it.

To clearly understand the intimate connection of perspectivism with the identity conception, we will mention Fechner's example of the circle that we find in the introduction to his *Elemente*. Fechner, while proposing some general considerations on the relationship (*Beziehung*) between body and mind, employs the example of the circle, to point out that

---

[27] G. T. Fechner, *Elemente der Psychophysik*, I, 6; on "Wechsel des Standpunkts" see: M. Heidelberger, *Die innere Seite der Natur. Gustav Theodor Fechners wissenschaftlich-philosophische Weltauffassung* (Frankfurt am Main: V. Klostermann, 1993), 130.

[28] See: Leibniz G. W., *Principes de la Nature et de la Grace fondés en Raison, Principes de la Philosophie ou Monadologie* (Paris: Presses Universitaires de France, 1954), 105.

concave and convex are two perspectives of the same thing and that they are related to the subjective point of view on the same reality: the circle. Fechner wrote:

> Z. B. wenn Jemand innerhalb eines Kreises steht, so liegt dessen convexe Seite für ihn ganz verborgen unter den concaven Decke; wenn er ausserhalb steht, umgekehrt die concave Seite unter der convexen Decke. Beide Seiten gehören ebenso untrennbar zusammen, als die geistige und leibliche Seite des Menschen und diese lassen sich vergleichsweise auch als innere und äussere Seite fassen; es ist auch ebenso unmöglich, von einem Standpunkte in der Ebene des Kreises beide Seiten des Kreises zugleich zu erblicken, als von einem Standpunkte im Gebiete der menschlichen Existenz diese beiden Seiten des Menschen. Erst wie wir den Standpunkt wechseln, wechselt sich die Seite des Kreises, die wir erblicken, und die sich hinter der erblickten versteckt. Aber der Kreis ist nur ein Bild, und es gilt die Frage nach der Sache.[29]

This aspect of Fechner's metaphysics recalls Leibniz, whose thought undoubtedly influenced Fechner's concept of pre-established harmony (*prästabilirte Harmonie*), present both in *Zend-Avesta* and in *Elemente*.[30] According to Leibniz, mind and body are two clocks marking the same time, by virtue of the pre-established harmony between them. Fechner pointed out that Leibniz had not considered the much simpler possibility that body and mind might be synchronous, being one and the same clock, which appears either externally or internally.

Starting from his unitary understanding of the mind–body problem Fechner further embraced a parallelism of the psychical and bodily objects.[31] Fechner's parallelism was undoubtedly monistic, exactly as Spinoza would have meant it, and opposed Leibniz's dualistic parallelism, which considered mind and body as two clocks that are synchronous

[29] G. T. Fechner, *Elemente*, 2–3.

[30] See: G. T. Fechner, *Zend-Avesta*, II, 347f.; *Elemente*, I, 5.

[31] See: G. T. Fechner, *Zend-Avesta*, II, 330.

thanks to the pre-established harmony. Fechner strongly upheld Spinoza's thesis, also thanks to Schelling's writings on the philosophy of nature, according to which the mind–body whole constitutes one and the same element. Fechner rejects the validity of Leibniz's thesis.[32] Schelling is an important source for Fechner's considerations. As highlighted by Heidelberger, Fechner and Schelling provided similar answers to the problem of the causal relation between mind and body. In his *System der gesammten Philosophie und der Naturphilosophie insbesondere* (1804) Schelling stated:

> No causal relation is possible between the real and the ideal, or between being and thinking; thinking can never be the cause of a distinction in being, or conversely, being can never be the cause of a distinction in thinking. For what is real and what is ideal are only different views of one and the same substance; they can effect as little in each other, as a substance can effect something within itself. They do not match, as two different things can match, for which the cause of harmony is something outside of themselves, as Leibniz' harmony has been understood and explained using the example of two clocks; but instead, they match because they are not two different things, they are only one and the same substance. Just as (to use a convenient example) a person who had two names is still one and the same person, and the person named A is the same as the person named B, and does the same things, not because they are somehow linked or one of them causes the other, but because the person called A and the person called B are, in fact, one and the same person.[33]

[32] Du Bois-Reymond warned that Leibniz did not forget but clearly rejected the possibility that the two clocks might be the same one. To explore this argument see: Du Bois-Reymond, *Über die Grenzen des Naturerkennens* (Leipzig: Verlag von Veit & Comp, 1872), 20f; M. Heidelberger, *op. cit.*, 138.

[33] F. Schelling (1804), *Sämtliche Werke* (Stuttgart and Augsburg: Cotta'scher Verlag, 1860), 6th vol., 500–1. The English translation is in: M. Heidelberger, *Nature from Within. Gustav Theodor Fechner and his Psychophysical Worldview*, C. Klohr (trans. by) (Pittsburgh: University of Pittsburgh Press, 2004), 114. Both Fechner and Schelling presented arguments against Leibniz's dualistic parallelism; to explore Schelling's

In conclusion, we can say that Fechner's perspectivism, which was in many aspects similar to that of Leibniz, ultimately led Fechner to a monistic parallelism that is in clear contrast with Leibniz's dualism.

It is necessary to note what Fechner meant by his metaphysical position, defined as conception of identity. It is obvious that Fechner's position cannot be identified with our contemporary identity theory in philosophy of mind but rather with a two-sided theory of mind and body (*Zwei-Seiten-Theorie*).[34] The reference to dualism should not mislead us,

---

influence on Fechner see: M. Heidelberger, *op. cit.*, 32f. and 153f. It is worth noting that Schelling's writing mentioned above was published for the first time in *Nachlass* and that, for this reason, Fechner could not have read it while writing *Zend-Avesta*.

[34] Rudolf Carnap, in *Der logische Aufbau der Welt* (Berlin-Schlachtensee 1928, § 22, 28–29), stated that the problem of psychophysics is the central problem of metaphysics, because it raises the question of the connection (*Verbindung*) of the physical process with the psychic one. Carnap posed the psychophysical question within metaphysics, because this concerns the essential connection (*Wesensbeziehung*) between mind and body and not the simple coordination (*Zuordnung*) of the two. Alongside occasionalism and pre-established harmony now explored mainly from the historical point of view, the attempts made to solve the question—according to Carnap's argument—are the theory of interaction (*Wechselwirkung*), of the psycho-physical parallelism, and the theory of identity understood as two-sided theory (*Zweiseitentheorie*). As regards the theory of identity, Carnap stated that "the identity theory does not even admit that there are two types of objects, but assumes that the psychological and the physical are the two 'aspects' ('the outer' and 'the inner') of the same fundamental process." Carnap's position in this regard is well known: he thought that questions about the essence (*Wesen*) and the essential foundation (*Grund*) are posed in the wrong way; according to him, metaphysics tries to answer wrong questions. Carnap continued: "Once the constructional forms of the objects and the object types are found and their logical locations in the constructional system are known, and if furthermore the correlation problem of one of the above relations has been resolved, then we have found everything (rational) science can say about that relation. An additional question concerning the 'essence' of the relation would lack any sense. It

since it is not a metaphysical dualism, as we have already said, but a dualism depending on the perspectivism of the subject's observation and thus emerging at the level of the appearance (*Erscheinung*). The identity of the mind–body remains actually unchanged. As Fechner wrote:

> Sie (die Identitätansicht) ist *von einer Seite* ganz materialistisch, denn das Geistige muß sich danach überall ändern, nach Maßgabe als sich das Körperliche ändert, worin es sich ausdrückt, erscheint in sofern ganz als abhängig davon, als Function desselben, ja läßt sich ganz in solches übersetzen; aber sie ist *von der andern Seite* ganz spiritualistisch und idealistisch; denn für sich existiert gar nichts Materielles, es hat als solches eine Existenz blos für den Geist gegenüber, als Ausdruck von etwas sich geistig selbst Erscheinenden für andern Geist; ist in sofern ganz Function des Geistigen und Verhältnisses von Geist zu Geist.[35]

What we have seen clearly suggests that the accusation of reductionist positivism directed at Fechner is unfounded, because, if we adopt its metaphysical construction, it is not possible to reduce the mind to the physical aspect, since they share the same ontological root, so that what we call 'physical' and 'mental' are nothing more than mere phenomenal appearances of that metaphysical unity.

It is now clear why Fechner claimed to be able to measure the psychic aspect only *indirectly* through the physical stimulus (*Reiz*); between the physical stimulus and the psychic 'response', understood as perception (*Empfindung*), there is not a relation of cause and effect, or in other words, there is not a physical element ontologically different from the psychic,

---

cannot even be formulated in scientific terms." (English translation: *The Logical Structure of the World and Pseudoproblems in Philosophy*, Rolf A. George (transl. by) (California: University of California Press, 1967). See also: M. Heidelberger, *op. cit.*, 142f.

[35] G. T. Fechner, *Zend-Avesta*, II, 348.

which corresponds to the effect; there is only a functional relation and not a constitutive dependence of the psychic on the physical aspect. Functional relation clearly means here that what is phenomenally (in *Erscheinung*) different—because of the point of view—is metaphysically one thing, and therefore the scientist is free to choose the part most suitable for measurement. Fechner said:

> Insoweit ein functionelles Verhältniss zwischen Körper und Seele besteht, würde an sich nichts hindern, dasselbe eben so in der einen als in der anderen Richtung ins Auge zu fassen und zu verfolgen, was man sich passend durch das mathematische Functionsverhältniss erläutern kann, das zwischen den Veränderlichen x und y einer Gleichung besteht, wo jede Veränderliche beliebig als Function der anderen angesehen werden kann, und dieselbe in ihren Veränderungen von sich abhängig hat. Ein Grund aber für die Psychophysik, den Verfolg der Seite der Abhängigkeit der Seele vom Körper vor der gegentheiligen zu bevorzugen, liegt darin, dass nur das Physische dem Masse unmittelbar zugänglich ist, indess das Mass des Psychischen erst in Abhängigkeit davon gewonnen werden kann, wie später gezeigt wird.[36]

We have to underline that there are two types of psychophysics, one external and one internal: the external deals with the relationship between stimulus and nerve activity, the internal with the relationship between nerve movement and the production of sensations.[37] Fechner explained that his law deals mainly with internal psychophysics. Basically, he considered the changes and movements of the sensory organs as proportional to the intensive changes of psychic activity; this is what gives rise to the logarithmic relationship between mental and physical activity.[38]

[36] G. T. Fechner, *Elemente*, I, 9.

[37] See: *ibid.*, 10f.

[38] On Fechner's famous measurement formula (*Maßformel*) see: G. T. Fechner, *Elemente*, II, 11–13.

2.3.3. Alfred Wilhelm Volkmann

Alfred Wilhelm Volkmann's studies of optical physiology[39] greatly influenced the analysis of the visual localization on which Lotze founded his psychological notion of local signs. All these studies—including also Treviranus' and Weber's considerations on the constitution of the retina—were based on the idea that the nerve endings located in the retina, along with their specific qualities, are able to sense their exact position within the retina.[40]

Lotze was very interested in the studies of optical physiology, as suggested by a letter that he wrote to his friend Apelt which reviews the debate between Treviranus, Weber and Volkmann on the localization of image on the retina and the problem of the schematic representation.[41]

[39] See: A. W. Volkmann, *Neue Beiträge zur Physiologie des Gesichtssinnes* (Leipzig: Breitkopf und Härtel, 1836), 24–34.

[40] The results of Treviranus' research were of fundamental importance to Müller's theory of the acquisition of the perception of spatiality through nerve activity; see J. P. Müller, *Handbuch*, II, 262, 263, 271.

[41] On this issue, see: W. Woodward, *op. cit.*, 58.

3. The reductionist approach to the mind–body problem and its critics

On the basis of these scientific results, in Germany around the middle of the 19th century new openly reductionist materialist positions were presented by Friedrich Karl Christian Ludwig Büchner, Jakob Moleschott and August Christoph Carl Vogt. They tried to reduce the whole human sphere to mere physiological characteristics and, as an implication, to study human mind through the methodology of quantitative sciences. In order to understand more clearly the adverse context in which Lotze wrote *Medicinische Psychologie*, as well as the problems at stake in the transformation of psychology into a science, we should first focus on what happened in this realm in France in the early 19th century.

This is the context in which P. J. G. Cabanis, in dealing with the Cartesian problem of *res cogitans* and *res extensa*, attempted to overcome such dualistic conception and to advance a physical monism instead, by reducing all manifestations of *res cogitans* to physical events.[1] Cabanis' main idea consisted in asserting the unity of matter and mind, both understood in a physical way. In this respect, physiology presented itself as the branch of science capable of reconstructing the human mind based on the study of the body's organization. As F. A. Lange explained:

[1] This conception is related to those of Julien Offray de La Mettrie, Étienne Bonnot de Condillac and John Locke. At the core of Cabanis' conception there is the experimental observation of sensory processes.

> Since Cabanis, therefore, the resolution of mental functions into the activity of the nervous system has kept its ground in physiology, whatever individual physiologists may have thought as to the ultimate grounds of all things.[2]

The same idea of the unity of mind and matter was adopted by the German Materialists Ludwig Büchner, Jacob Moleschott and Karl Vogt between the 1830s and 1850s. These thinkers had adopted from German Idealism, then in its decline, the demand for a single, systematically formulated guiding principle capable of explaining nature in its totality. However, they no longer meant the 'totality' as related to mind, but rather to the physical-physiological organization of bodies. In this way the German Idealism was inverted, although its intrinsically monistic approach remained unchanged. In fact, the radical German materialists, availing themselves of the rich physiological research of that time, tried to reduce all the sensory, volitional and cognitive processes to a physiological process.

It is worth pointing out here that, in those years, Germany was at the forefront of scientific research. It is sufficient to consider the chemical research carried out by Justus von Liebig: the chemical laboratory he directed at Giessen is the first case of modern teamwork research unit. We should also mention other contributions to science such as Alexander von Humboldt and Christian Gottfried Ehrenberg's naturalistic research in geography, botany and zoology, Heinrich and Gustav Rose's explorations in chemistry and mineralogy. Johannes Müller's *Handbuch der Physiologie* (1833) and Ernst Heinrich Weber provided a strong scientific and mathematical component to the physiological research, which until then had been decisively affected by idealistic *Naturphilosophie*. The influence of the French researchers, Jean Pierre

[2] F. A. Lange, *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart* (Iserlohn: Verlag von J. Baedeker, 1875), 70; english trans., *The History of Materialism and Criticism of Its Importance*, Ernest Chester Thomas (trans.), (London: Trübner & Company, 1877–1881), II, 243.

Marie Flourens, François Magendie, François Leuret, François Achille Longet, Paul Broca, had also played an important role in the development of the physiology of cerebral and nervous system. The great amount of experimental data collected by these authors had a foundational role with respect to the new radical Materialism. Whereas it is true that the physiological research can provide important contributions to understand cognitive processes, the real aim of the new Materialists was to bring human mental life back to its physiological roots. According to the Materialists, the rise of new fields of scientific analysis and physiological research, along with the outcomes of physics and chemistry, provided the theoretical conditions for the reduction of every psychic manifestation to physical events, in the way that it could be explored on the basis of experimental data.

In his most important work *Kraft und Stoff* (1855), Ludwig Büchner stated that all brain processes—which are subject to the principle of conservation of energy (*Erhaltung der Kraft*), a cornerstone of his materialism—can be explained in terms of mechanical laws. Büchner aimed at providing a comprehensive mechanical explanation of human being which could account for all his mental activities, including the so-called higher mental functions. It is precisely in this work that Büchner took his radically materialistic and reductionist turn, claiming that all brain activities, in addition to obeying mechanical laws, also produce mind (*Geist*) as their proper effect. This point of view reduces the mind, understood in the sense of psychic activity, entirely to the mechanical activity of the brain.

3.1. Hermann von Helmholtz

It is interesting to highlight the fact that, in 1847, a few years before the publication of Büchner's *Kraft und Stoff*, also Hermann von Helmholtz, prompted by an aversion to the

theory of perpetual motion, had already published two papers on the conservation of energy.[3] Helmholtz developed his interest in this subject in the expressly physiological context of animal heat, as attested by his paper "Über die Wärmeentwicklung bei der Muskelaction", also published in 1847, wherein he related animal heat to the mechanical force of kinetic energy which derives from the movements of the muscles. In this connection, Helmholtz argued for the principle of the impossibility of perpetual motion and thus rejected the idealistic and romantic concept of a vital force—a force that supposedly defied the laws of thermodynamics and could generate and regenerate indefinitely—which is secured by a possible perpetual motion. The central problem of physiology in Germany in the mid-19th century was whether or not the origin of animal heat could be explained in terms of a vital force, that is, whether or not it had a vital force as its underlying cause.[4] Here, Helmholtz clearly followed Justus von Liebig who argued for the principle of the correlation of forces, stating in 1841 that "no force can originate from nothing" ("aus Nichts kann keine Kraft entstehen"), thus rejecting the idea of a vital force as the cause of animal heat.[5] Both Liebig

[3] H. von Helmholtz, "Bericht über 'die Theorie der physiologischen Wärmeerscheinungen' betreffende Arbeiten aus dem Jahre 1845", *Fortschritte der Physik im Jahre 1845* 1 (1847): 346–55; reprinted in: *Wissenschaftliche Abhandlungen von Hermann von Helmholtz*, 3 vols., Braunschweig: Friedrich Vieweg und Sohn, 1903, vol. 1:3–11; and: *Über die Erhaltung der Kraft. Eine physikalische Abhandlung* (Berlin: G. Reimer, 1847); reprinted in: *Wissenschaftliche Abhandlungen von Hermann von Helmholtz*, 3 vols., vol. 1:12–75 (including an appendix [68–75] from 1881).

[4] See: Timothy Lenoir, *The Strategy of Life: Teleology and Mechanics in Nineteenth-Century German Biology* (Dordrecht and Boston: D. Reidel, 1982), 195–96, 215–17, 230.

[5] Justus Liebig, *Chemische Briefe*, 3rd ed. (Heidelberg: C. F. Winter, 1851), twelfth letter, pp. 116–18, quoted in G. Helm, *Die Energetik in Ihrer Geschichtlichen Entwicklung* (Leipzig: Verlag von Veit & Comp., 1898), 10; Arthur Erich Haas, *Die Entwicklungsgeschichte des Satzes von der Erhaltung der Kraft* (Vienna: Alfred Hölder,

and von Helmholtz conceived mechanical forces and the heat produced by an organism as rooted in a common source. The principle of the correlation of forces (mechanical forces and animal heat) lent a more sophisticated expression to the principle of the impossibility of perpetual motion, allowing Helmholtz to demonstrate that mechanical, electrical and chemical forces in effect create a certain specific equivalent of heat.

The physiological research of Liebig and, to an even greater extent, that of Helmholtz, are difficult to reconcile with the reductionist position taken by Büchner. While it is true that for Helmholtz, mechanical forces generate animal heat, in his view, these forces alone do not suffice to explain the constitution of the human brain, and even less so the higher mental functions. Helmholtz's physiological research taken as a whole—that is, with the added consideration of his experimental investigations of the sense organs—stressed the fact that the activity of the mind is a fundamental and irreducible element of perception. In his *Populäre wissenschaftliche Vorträge* (1871–1876), Helmholtz stated that every sense perception is accompanied by a psychic activity which he called "unconscious inference".[6]

1909), 57; and Thomas Kuhn, "Energy Conservation as an Example of Simultaneous Discovery", in *Critical Problems in the History of Science*, Marshall Clagett (ed.), (Madison, Wis.: University of Wisconsin Press, 1959), 321–56, reprinted in Kuhn's *The Essential Tension: Selected Studies in Scientific Tradition and Change* (Chicago and London: University of Chicago Press, 1977), 66–104, 95.

[6] The leading opponent of Helmholtz's position was Karl Ewald Konstantin Hering (1834–1918). In the *Beiträge zur Physiologie* (1861–64), he argued that spatial perception had its own *innate* structural order and therefore rejected any role of psychology in the formation of perception proper. In *Zur Lehre vom Lichtsinne*. *Sechs Mittheilungen an die Kaiserl. Akademie der Wissenschaften in Wien*. Zweiter, unveränderter Abdruck (Wien: C. Gerold, 1878),) Hering directly criticized Helmholtz's notion of unconscious inference (*unbewusster Schluss*), stating that the idea that the same stimulus (*Reiz*) gives rise to completely different perceptions (*Wahrnehmungen*) leads us to a scientific explanation such that sensation (*Empfindung*) is interpreted in

While Helmholtz recognized the existence of mental activities that, based on the experimental data available at the time, were not entirely reducible to physiological events,

---

different ways or that the given sensory material (*das gegebene Empfindungsmaterial*) is re-elaborated through *unconscious inferences,* giving rise to different representations. As Hering continued, we hypothesize here that sensations are something more corporeal (*mehr Körperliches*), whereas the interpretation of sensation or its elaboration as representation is a purely mental activity (*mehr Geistiges*) based on an activity of the mind that guides it. According to Hering, this way of approaching the problem leads to divide our psychic process into two main classes: *sensations*, which are more bodily and, consequently, directly and immediately dependent on the states of the nervous system, and *representations*, which are rather mental phenomena and, consequently, dependent only indirectly on the states of the nervous system, so that they are considered as products of a free psychical activity. According to Hering, the division in two groups of our psychical activity reflects the old distinction between body and mind and is the result of a mentalism (see on this concept 94n) that tries to deal with physiology, by offering it "pure sensations" as sacrifice, although it considers "representations" as completely specific of the mind. In his conception, the same stimulus does not produce the same sensation, which is then interpreted in different ways, but the same stimulus immediately gives rise to two different sensations. The reason of that is related to the fact that sensation—in this case luminous sensation—is not a simple function of the stimulus, nor the condition of the part of the nervous system activated by the stimulus. It depends on the relative conditions of that part of the brain related to the visual act which contains and organizes the optical experiences of our whole life. Exactly as the sound produced by the key of a piano does not depend only on the vibrations of the strings, but also on the resonance of the whole instrument, in the same way the sensation produced by an external stimulus within us does not depend only on the nerve fiber affected by the stimulus, but also on the result of the resonance of our entire sensory system (*Sensorium*). In this sense, Hering's position can be defined as 'nativistic', because the structural order of our perceptions is already contained in the cerebral organization and also because, against Helmholtz, he rejected any psychological explanation of perceptual processes that refers to the activity of the mind. Our sensations and perceptions depend on our cerebral constitution and only a physiological study can explain them. (See: E. Hering, *Zur Lehre vom Lichtsinne*, 67–69.)

this does not mean that he renounced the idea that such a reduction was possible in principle. Rather, his recognition may be read as a cautioning that the radically reductionist position was not scientifically sustainable.

3.2. The dispute between Büchner and Lotze

The basic tenet of Materialism is that everything—both the macrocosm and the microcosm—is subject to mechanical laws. Force and matter thus cannot belong to two separate domains of reality and must instead be bound up in an intimate relation, where force is conceived of as a property of matter. In fact, Büchner believed that such a separation would allow for a reintroduction of the concept of vital force, as derived from the *Naturphilosophie* of the German idealists, which he dismissed as mere "figures of speech" (*Redensarten*) and "philosophical charlatanry".[7] As he puts it, "matter is the vehicle of all mental power, of all human and earthly greatness".[8] With regards to materialism, he states:

> We frequently hear those persons contemptuously called *Materialists*, who do not share the fashionable contempt for matter, but endeavour to fathom by its means the powers and laws of existence; who have

[7] When we speak of *Naturphilosophie*, we refer here to Schelling's philosophy of nature. We should notice, however, that in the Berliner Gruppe of Hans Reichenbach and Walter Dubislav (1926–1933), this term was also used to mean a systematic representation of nature with the help of logical-mathematical methodology; see: W. Dubislav, *Naturphilosophie*, (Philosophische Grundrisse Heft 2) (Berlin: Junker & Dünnhaupt, 1933); H. Reichenbach, *Ziele und Wege der heutigen Naturphilosophie* (Leipzig: Felix Meiner, 1931); new edition: *Ziele und Wege der heutigen Naturphilosophie*, N. Milkov (ed.), (Hamburg: Felix Meiner Verlag, 2011).

[8] L. Büchner, *Kraft und Stoff. Empirisch-naturphilosophische Studien. In allgemein-verständlicher Darstellung* (Frankfurt a. M.: Meidinger, 1855), 23; english transl., *Force and Matter: Empirico-Philosophical Studies, Intelligibly Rendered*, J. Frederick Collingwood (trans.), (London: Trübner & Co, 1864), 28.

> discerned that spirit could not have built the world out of itself, and that it is impossible to arrive at a just conception of the world without an exact knowledge of matter and its laws.[9]

For Büchner, the natural laws governing the movement of matter are eternal and immutable. Everything can be explained as an expression of this unconditional necessity; in a cosmos ruled by mechanistic determinism, there is no place for the concept of the purposiveness (*Zweckmäßigkeit*) of nature which is instead conceived by him as a non-operative product of our reflection (*reflektierender Verstand*).

Against the materialists in philosophy of mind, in his *Allgemeine Physiologie des körperlichen Lebens* (1851), Rudolph Hermann Lotze introduced the concept of *teleo-mechanism*. He explained it in the following way:

> If the foetus is without a brain, it would be but judicious, in a force having a free choice, to suspend its action, as this deficiency cannot be compensated. But, inasmuch as the formative forces continue their action, that such a miserable and purposeless creature may exist for a time, appears to us strikingly to prove, that the final result always depends upon the disposition of purely mechanical definite forces, which, once set in motion, proceed straight on, according to the law of inertia, until they meet with an obstruction.[10]

A year later Lotze wrote: "nature, having no confidence (*misstrauen*) in the inventive power of the mind (*Erfindungsgeist der Seele*), has endowed the body with certain mechanical contrivances."[11]

---

[9] *Ibid.*, 23–24; e. t., 29.

[10] R. H. Lotze, *Allgemeine Physiologie des körperlichen Lebens* (Leipzig: Weidmann'sche Buchhandlung, 1851), 114. The English translation of this quotation is in L. Büchner, *Force and Matter* (p. 99).

[11] R. H. Lotze, *Medicinische Psychologie oder Physiologie der Seele* (Leipzig: Weidmann'sche Buchhandlung, 1852), 292. The English translation of this quotation is in L. Büchner, *Force and Matter* (p. 99).

Lotze's double philosophical register—he attributed to nature both a mechanical and a teleological character—was sharply criticized by Ludwig Büchner in *Kraft und Stoff*. Büchner maintained that Lotze's philosophy was contradictory. On the one hand, he asserted that nature proceeds according to the law of inertia, with no finality nor purposiveness, mentioning the example of the headless foetus; on the other hand, he stated that there is a reason (*Grund*) for nature's mistrust (*misstrauen*) towards the inventiveness of the mind (*Erfindungsgeist der Seele*). In this way he clearly recognized that biological nature is able to self-orient itself towards a certain finality and purposiveness. Büchner decisively rejected this teleological capacity of nature. According to him, every daily medical observation shows us that nature proceeds simply on the basis of a blind mechanical necessity; these observations show us nature's helplessness (*Hilflosigkeit*) to escape from the universality of the mechanism and the deterministic system, its quite aimless (*unzweckmäßig*) direction, wrong or unsuccessful despite its healing efforts.[12] Karl Vogt agreed with Büchner and in his *Köhlerglaube und Wissenschaft. Eine Streitschrift gegen den Hofrat Rudolph Wagner in Göttingen* (Gießen: Ricker'sche Buchhandlung, 1855) discarded with no hesitation Lotze's teleo-mechanism as "wild speculation [*spekulierenden Struwelpeter*]".

Based to the principle of teleo-mechanism—on which we will focus later—Lotze maintained that all the processes that take place in the cosmos, either biological or cultural, are mechanical processes. In arguing so, Lotze rejected what the philosophy of biology considered as the validity of the metaphysical principle of vitalism, since it is of no use in that field.

According to Lotze, the principle of mechanism is universally valid because of its extension. However, Lotze also held that, as for its own meaning (*Bedeutung*), it is subsumed

[12] See: L. Büchner, *op. cit.*, 83–87.

under the fundamental teleological structure of the real. The idea that the mechanism activates in all processes and that these latter constitute only a superficial structure, under which there is a more foundational teleological structure—which in biological writings is called '*dynamis*' and *orients* the development of the whole living world—is a constant of Lotze's philosophical reflection. As Nikolay Milkov pointed out:

> In Lotze's hands, the "Principle of Teleomechanism" (i.e., that ultimate explanations should have the hybrid form described above) shapes logic, metaphysics and science through what he calls idealities (Orth 1986, p. 45)—the fundamental *orienting* concepts of these fields. Among the idealities are ethical values, logical validities and aesthetic worth. In science and Metaphysics, the idealities of spatial and temporal order, the principle of atomicity and the aforementioned relationism, play a central role.[13]

This passage suggests that Lotze's philosophy was not thus contradictory, as stated by Büchner. Lotze's philosophy conceived a bi-dimensional reality in which the foundation, understood as fundamental reality, is the value that provides phenomenal reality with an end. Once the phenomenon becomes real and *begins* its course, it proceeds according to the mechanical law of inertia. For this reason, Lotze posed the problem of the *beginning*. And this leads us to the fundamental question of why reality is so and not otherwise.

The fundamental structure of being is teleological; reality, before becoming a phenomenon, is already self-oriented according to a precise direction and not another. In *Allgemeine Physiologie des körperlichen Lebens* (1851), reported then by Büchner in *Kraft und Stoff*, Lotze stated that, once *put in action* (*wenn er einmal eingeleitet ist*), the course of reality proceeds regardless of the purpose, guided only by the mechanical law of inertia

[13] N. Milkov, "Rudolph Hermann Lotze (1817–1881)", *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/lotze/.

(*Gesetze der Trägheit*). In fact, the verb put in action ("*einleiten*") is at the core of Lotze's argument, because, once the phenomenal course has come to being, it is unavoidably subject to the universality of the mechanism. However, mechanism itself is not able to direct reality towards a specific conformation rather than another, since, according to the mechanical laws, there are many possible courses of nature and it is the above-mentioned value—being fundamental and prior to the beginning of the phenomenal course of nature—that privileges one of them. Precisely for this reason, in Lotze's philosophy teleology and mechanism can coexist without contradictions.

3.3. Two further scholars

3.3.1. J. F. Herbart

The need for a specific psychological analysis and the opposition to the reductionist approach were an active and central aspects of a part of the German debate at that time. According to Johann Friedrich Herbart it was not possible to consider psychology as an empirical science, because usually empirical sciences reach their conclusions, i.e. their general concepts, by producing abstractions based on the observational material. In contrast, in Herbart's opinion, psychology cannot be provided with such a clearly observable material, for example, by self-observation (introspection). As a result, Herbart questioned the validity of the traditional theory of the general faculties of human mind. He explained that, these general faculties (concepts), e.g. representation, feeling, desire, are generated through abstractions based on mere self-observation which cannot provide clear empirical material ex definitio. Furthermore, according to Herbart, neither empirical nor experimental knowledge can supply a solid basis for psychology. Psychological investigations can rather be substantiated only through metaphysical speculations, because psychology and metaphysics share essential themes which remain

on the frontier between them—the problems of time, change, the one-many relation as well as the relation between the ego (*Ich/Ichheit*) and its representations. At the same time, in exploring the foundations of psychology, metaphysics is supported by mathematics, since, as long as mental representations are characterized by different degrees, they can be mathematically quantified.

Herbart further held that representations differ according to the variability of their alertness (*Regsamkeit*) as well as to their mutual inhibition (*Hemmung*). Herbart also meant that:

> Jetzt ist uns gestattet, dieses, was aus der Zusammenfassung in Ein Vorstellen entspringt, näher anzugeben, nämlich in so fern es die Grundlage der Ichheit bildet. Die Objecte der Vorstellungen sind es nicht, wohl aber die Regsamkeit des Vorstellens selbst in seiner Hemmung, wovon sich einsehn lässt, dass es dasjenige ausmachen werde, worin wir Uns Selbst erkennen. Eben das, was zum Gedächtnis und zum Willen gerechnet werden kann, dieses mag auch uns bezeichnen; es mag helfen, jenes bisher vergeblich gesuchte Object im Begriff des Ich allmählig aufzufinden.[14]

Precisely on the basis of this mutual variation and inhibition in representations we form our concept of Ego (*Ich*/*Ichheit*).[15] In his mathematical psychology, Herbart highlighted that if on the one hand representations vary according to its vivacity (*Regsamkeit*, *Stärke*) and inhibition (*Hemmung*), on the other there is a variable intensive magnitude which, in principle, can be calculated. According to him, it is not true that we can calculate only what

[14] J. F. Herbart, *Psychologie als Wissenschaft neu gegründet auf Erfahrung, Metaphysik und Mathematik. Erster synthetischer Theil*, in *Sämtliche Werke*, 19 vols. (Darmstadt-Eberstadt: Scientia Verlag Aalen, 1964), 5th vol., 276–77.

[15] On the formation of the concept of "I" and on the problematic nature of Fichte's philosophy, as expressed by Herbart, see: R. Martinelli, *op. cit.*, 19–27.

has been already measured. In *Über die Möglichkeit und Nothwendigkeit, Mathematik auf Psychologie anzuwenden* (1822) Herbart clearly stated that it is possible to calculate without measuring—the examples of Kepler and Newton had been of great importance here,—emphasizing the possibility of adopting a hypothetical use of mathematical calculation in psychology. As Herbart pointed out:

> *Wo man nun aber nicht messen kann, da kann man auch nicht rechnen*; folglich ist es nicht möglich, in psychologischen Untersuchungen, sich der Mathematik zu bedienen.—So lautet der Syllogismus, welcher sich aus dem Kleben an dem Gewohnten und aus einer augenscheinlichen Unwahrheit zusammensetzt. Es ist nämlich, um beim letzten anzufangen, ganz falsch, dass man nur da rechnen könne, wo man zuvor gemessen hat. Gerade im Gegentheil! Jedes hypothetisch angenommene, ja selbst jedes anerkannt unrichtige Gesetz einer Größenverbindung lässt sich berechnen; und man muss bei tief verborgenen, aber wichtigen Gegenständen sich so lange in Hypothesen versuchen, und die Folgen, welche aus denselben fließen würden, so genau durch Rechnung untersuchen, bis man findet, welche von den verschiedenen Hypothesen mit der Erfahrung zusammentrifft.[16]

According to Herbart, it is possible to calculate representations, understood as variable intensive magnitudes, on the basis of their energy, force (*Stärke*) and inhibition.[17] In fact, Herbart considered mental life as a mechanics of representations that can be calculated mathematically through the higher analysis of differential and integral calculus which is fairly appropriate for the fluidity of the psychic process. To be more explicit, the elements of the series of mental representations that can be measured mathematically are: the force of each single representation, the degree of inhibition between two representations, the degree

[16] J. F. Herbart, *Über die Möglichkeit und Nothwendigkeit, Mathematik auf Psychologie anzuwenden*, in *Sämtliche Werke*, 19 vols., 5th vol., 96–97.

[17] See: J. F. Herbart, *ibid.*, 102.

of connection between representations, the set of the interconnected representations and the length of the series of representations. The statics and the mechanics of the mind (*Statik und Mechanik des Geistes*) carry out the calculation of representations' balance and dynamic. According to Herbart, the human mind is a simple essence (*einfaches Wesen oder Reales*) which comes into conflict with other simple essences; in this conflict for self-preservation (*Selbsterhaltung*) the mind produces representations. In this sense, according to Herbart, the essence of mind expresses itself in external actions (*äussere Einwirkung*) and reactions (*Rückwirkung*). It is, therefore, within this process of interaction between particular essences that the formation of representation takes place.

Dealing with the mechanics of mind which, as mentioned above, focuses on the movement of representations, Herbart tackled the problem of the formation of those series of representations that he called "*Complexionen*". These latter emerge either from a fusion (*Verschmelzung*) or from a complication (*Complication*), depending on whether it is formed by homogeneous or heterogeneous representations.

The product of these series of representations has a spatial character or, as Herbart said, can be something spatial (*ein Räumliches*). However, this 'spatial' feature of representations does not necessarily belong to the "*sinnlicher Weltraum*".[18] Herbart's main idea here was that space is a mental construction; the intelligible space of metaphysics is a constructed space. He further stated that objects of pure geometry are not placed in the space of the sensitive world, which is rather occupied by bodies, by the emptiness between bodies. The figures of pure geometry have no place in it and do not even emerge, nor do they stand out against the sensible space by limitation. Rather, their formation is completely different and takes place in

[18] J. F. Herbart, *ibid.*, 415. To be more explicit, Herbart stated that: "Das Product solcher, sich gegenseitig hervorrufender Reihen ist allemal ein Räumliches, obgleich nicht nothwendig eins im sinnlichen Weltraum."

a complete and defined space (*vollständiger Raum*) which is certainly not the space of the sensible world. Between the sensible space and the intelligible space of metaphysics there is the same relation as between the Platonic idea and its imitations. This idea has no place in the sensible world.

In brief, in its metaphysical value, space is an ideality, a mental construction separated from the sensible world. However even the space of the sensible world is not something given (*ursprünglich*)—or innate, as Kant would have said—but rather a construction that man elaborates basing on the visual, emotional, tactile sensation, which, independently of each other, allow for the construction of space. Only after the action of our productive activity, space becomes a unity, that is, "one" sensible space.

Herbart criticized the assumption according to which there is only one space: that of the sensible world. Strictly speaking, there is no space independent of the productive or constructive activity of the mind. There are only occasions (*Veranlassungen*) in which, through their fusion, the series of representations produce (*erzeugen*) a network of reproductive laws (*Reproductions-Gesetzen*), in which what is "represented (*Vorgestellt*)" is necessarily something spatial.[19]

Here Herbart clearly criticized Kant's transcendental aesthetics. Whereas Kantian space was a pure a priori and innate form of our cognitive structure, Herbart's conception is completely different: the intelligible and abstract space is not an innate form of our knowledge but a construction or a product of our mental activity. The representations of geometry (circle, square, polygons) assume, in the various series of mind representations, a spatial disposition prior to the abstract and intelligible space and, after that, our mental

[19] See: J. F. Herbart, *ibid.*, 416.

activity produces the "complete space" (*vollständiger Raum*) as the background (*Umgebung*) suitable for these ideas of geometry.

In brief, whereas Kant considered the infinite extension of abstract and intelligible space as a necessary condition for the knowledge of the things of experience, for Herbart this condition is the simple movement and balance of representations in our "inner theatre" that only as a construction gives rise to our representation of abstract space. Despite their specific differences, Kant and Herbart shared the idea that space has no ontological value. It is—in an innate way for Kant and in a constructed, produced and secondary way for Herbart—part of the human epistemological structure.

3.3.2. J. F. Fries

Jakob Friedrich Fries, another philosopher who dealt with the problem of human mind, was also important for the development of Rudolph Hermann Lotze's thought, especially with regard to his theoretical explorations of science. Although Lotze never directly referred to Fries in his works, we know from Lotze's correspondence (spanning in the period from 1835 to 1840) with Fries's student, Ernst Friedrich Apelt, that the two thinkers knew each other in person, and that Lotze was interested in Fries's work.[20] Apelt and Lotze, who was five years younger, originally met in the high school of Zittau; after completing high school, Apelt went to the University of Jena to study with Fries, where he continued his

[20] The reason why Lotze did not directly mention Fries are political and related to the Carlsbad Decrees (Karlsbader Beschlüsse), ministerial conferences held from August 6–31, 1819, which imposed measures aimed at monitoring and suppressing liberal and nationalistic tendencies in post-Napoleonic Germany. Fries was an open liberal, as well as a nationalist and a unionist. As a result of these ministerial decrees, in 1819 Fries was suspended from teaching; he was allowed to give mathematics and physics lessons again first in 1824, but was prohibited to teach philosophy till 1838.

philosophical and mathematical studies, and then to the University of Leipzig, where he studied mathematics and science. It was in Leipzig that Apelt and Lotze became close friends. Their correspondence offers first-hand knowledge of their philosophical interests. In particular, Lotze mentioned Ernst Heinrich Weber's lectures on the physiology of sense perception. He also discussed with Apelt Fries's philosophy of mechanism, which became later the basis for Apelt's theory of rational induction.

The most important of Fries's works for Lotze's scientific development was *Die mathematische Naturphilosophie nach philosophischer Methode bearbeitet* (1822). This work introduced the idea of a hypothetical-deductive scientific method, which has been central in the thought of the neo-Friesian Leonard Nelson at the beginning of the 20th century, and was also been recalled, after further debate, by Karl Popper's fallibilist theory of knowledge.[21] According to Lotze, a scientific law is hypothetical insofar as it consists in a logically hypothetical judgment stating what will happen in the future, if certain conditions are granted**.** The scientific approach of Lotze's philosophy was derived from Weber, Fechner, and Herbart as well as from Fries, although Lotze criticized the excessive formalism and mechanism of Fries's philosophy of nature, which, in his view, did not account for nor responded to the deeper problems of philosophy.

Lotze also criticized Fries's (and Kant's) conception of matter as a dynamic balance of forces. In this view, the mass of a material substance determines its dynamic movement when it is subject to the influence of external forces. According to Lotze, this understanding of

[21] On this subject see: N. Milkov, "Karl Popper's Debt to Leonard Nelson", in *Grazer Philosophische Studien* 86 (2012), 137–56. He argued that Popper had not elaborated his scientific thought alone and in complete opposition to the Vienna Circle. Neo-Kantian and Neo-Friesian Leonard Nelson had deeply influenced Popper's thought—through his student Julius Kraft,—especially as for his fallibilist theory of knowledge.

matter is fallacious because it disregards matters empirical properties such as extension and solidity. Opposing this view, Lotze proposed his concept of atomism, which supported the empirical dimensions of matter and took the individuation of material objects as central. In his 1822 work, Fries criticized what he considered to be Schelling's error: replacing the concept of material substance understood as *mass* with that of material substance considered as a set of forces (*Kräfte*), so as to deny the role of mechanism and to reach a dynamic theory of substance. Fries stated that:

> Das Schelling'sche Philosophem ist nämlich, wenn ich nicht irre, durch seinen Grundfehler von der Anwendung der wahrhaft mathematischen Methoden entfernt worden und konnte sich deswegen in der Anwendung auf äußere Naturlehre nur bei dem Gebrauch sehr unbestimmter allgemeiner Begriffe, (die meistenteils sogar nur von logischem und nicht von metaphysischem Ursprung sind,) gefallen.[22]

And he continued:

> das hat sich denn auch in der Ausbildung unsrer dynamischen Naturphilosophie häufig gezeigt. Schelling beging den Fehler, aus der kantischen Construction die materielle Substanz, die Masse als Grundbegriff wegzulassen und nur durch entgegengesetzte Kräfte die Construction vollenden zu wollen. Dieses Anziehen und Abstoßen ohne etwas, das angezogen und abgestoßen wird, gibt aber keinen bestimmten Begriff und ist ein mathematisch unbrauchbarer Gedanke. Daher wurden ihm und seiner Schule einige mathematische Zeichen und einige mathematische Kunstausdrücke ein Spielzeug, welches sie der Mathematik ganz widerstreitend gebrauchten. Und daraus bildete sich nachher der Hass dieser Naturphilosophie gegen die Genauigkeit der Mathematik und besonders gegen die Newton'sche Schule. Auf diese Weise mussten der Schelling'schen Naturphilosophie alle mathematischen Prinzipien verlorengehen und anstatt dessen nur leere

[22] J. F. Fries, *Die mathematische Naturphilosophie nach philosophischer Methode bearbeitet. Ein Versuch* (Heidelberg: Christian Friedrich Minter, 1822), V.

> logische Formeln wie z. B. der Gegensatz des Idealen und Realen, die Indifferenz entgegengesetzten Faktoren und ähnliche, übrigbleiben.[23]

Fries wanted to overcome the disadvantages of Schelling's *Naturphilosophie*, in order to achieve a science of living beings that would combine the empirical mathematical approach with an experimental one; in this way, not only psychology, but also biology would become a mathematical science. Adopting the theory of matter as mass, Fries directly opposed Schelling's conception of freedom, which was clearly incompatible with the categories of a deterministic physics.

Fries instead subscribed to the position argued for by Kant in *Metaphysische Anfangsgründe der Naturwissenschaft*, where this latter took the problem of matter as the proper subject of the physical sciences and stressed movement as its peculiar property. It is the movement what allows bodies to present themselves to the external sense, and it is no mere by chance that Kant defined the science of nature as a pure and applied theory of movement. Kant advocated uniting the a priori aspect of physical science (general physics) with the mathematical doctrine of movement.[24] He united matter (of which bodies are constituted) and dynamics (movement), by drawing on the Newtonian concept of physical

[23] *Ibid.*, 508.

[24] It is in this specific sense that Kant accepted a dynamic theory of matter. The movement of bodies had to be discussed in mathematical terms because mathematics, as an a priori discipline of the internal sense, was the only science capable of constructing the general concept of object and of conferring the a priori status of the science of dynamics. Given this, it is easy to grasp the difference between the concept of dynamics of Kant (and later in Fries) and that of Schelling. The latter attempted to broaden Kant's dynamic theory of matter to living beings by renouncing the concept of mass—which played such a fundamental role in defining material substance in Kant's philosophy—and by denying any kind of role to mathematics.

forces and by putting aside the chemical forces of attraction and repulsion. According to Kant, chemistry, unlike physics, lacks the a priori aspect that would ensure its scientific nature and thus remains a purely empirical doctrine, unable to access the level of a science of nature. Fries, for his part, found fault with Kant's definition of force as the cause of bodies' movement, arguing that, whereas the pre-Newtonian physics attributed the movement of bodies to the impact between them, Newton's law of universal gravity shows that this movement is not simply the result of that impact, but of a fundamental force which Fries called *Grundkraft*. In Fries's view, Kant made the mistake of considering the forces of attraction and repulsion as mere properties of the matter out of which bodies are constituted. Moreover, Fries stated that Kant considered other types of forces as unknowable a priori, since they are not necessary properties of matter—they are merely accidental.[25]

> Die frühere mechanische Physik ging von dem Vorurtheil aus, daß alle Veränderungen der Bewegung aus dem Stoß bewegter Massen erklärt werden müßten, weil der todten Masse keine active Kraft beygelegt werden dürfe und im Stoß sich die Massen nur leidend verhielten. Selbst Newton scheute noch dieses Philosophen, indem er sich dagegen verwahrte, seine allgemeine Anziehung einer Grundkraft zuschreiben zu wollen. Kant hob diesen Irrthum, indem er zeigte, die Gegenwirkung im Stoße werde ja selbst nur durch active Zurückstoßungskräfte gedacht, und indem er klar machte, daß wir metaphysisch die Ursach von Veränderungen der Bewegung gar nicht anders als durch stetig beschleunigende Kräfte denken können. Demgemäß wieß er nach, daß Körper ohne eine ursprüngliche Flächenkraft der Abstoßung und eine ursprünglich durchdringende Kraft der Anziehung unmöglich seyen, beschränkte aber zugleich die naturphilosophische Construction auf diese zwey Annahmen, indem er behauptete, andere Arten von Kräften

[25] Fries' criticism of Kant here seems to arise from a misunderstanding of Kant's thought. To be more explicit, Fries used the same arguments that Kant espoused in *Metaphysische Anfangsgründe der Naturwissenschaft* to criticize Kant. In the work just mentioned, Kant clearly spoke of a mathematization of dynamics and he was, as we know, very close to Newtonian positions.

> seyen nicht a priori erkennbar, seyen keine nothwendigen Eigenschaften der Materie, sondern zufällige, deren Erforschung der Erfahrung überlassen bleiben müsse. Da liegt aber eine widerrechtlich beschränkende methodische Regel zu Grunde. Kant hat nicht bedacht, daß die Construction a priori hier eigentlich der reinen Mathematik gehöre und nach deren Recht beurtheilt werden müsse. So maßt sich seine Metaphysik zu viel an, indem sie jeder möglichen Materie diese beyden Kräfte a priori zuschreibt und sogar den Grad der Anziehung bestimmt. Sie unternimmt aber auf der andern Seite zu wenig, indem sie die mathematische Natur dieser Untersuchungen verkennt.[26]

Fries concluded his argument against Kant by stating that the a priori construction of forces is not determined by the fact that they are necessary properties of matter, but because a purely mathematical description of the forces is possible:

> Die Bestimmung der Formen der Grundkräfte ist eine rein mathematische Lehre aus geometrischen Prämissen, so erscheint sie in der hier gegebenen Form und lässt noch eine weitere mathematische Entwicklung zu, mit welcher wir der Erfahrung in Rücksicht der Bestimmung einzelner Materien nie vorgreifen, aber wohl bestimmen, welche Hypothesen zu Erklärungsgründen überhaupt zulässig seyen oder nicht.[27]

Fries combined the mathematical with the experimental method because, in his view, the priority of experience is fundamental; all kinds of cognitive research cannot be reduced to a mere search for forms. The need for this union emerges clearly in his book *Neue oder anthropologische Kritik der Vernunft* where Fries dealt with the theoretical justification of synthetic a priori judgments. From Friesian standpoint, which is far distant from that of Kant, the a priori loses its character of universality and timelessness. Friesian a priori, considered as

[26] J. F. Fries, *ibid.*, 460–61.

[27] *Ibid.*, 461.

depending on the temporality of the human psychological process, acquires an anthropological character which is typical of Fries' thought. From a strictly philosophical-scientific point of view, this relativization means that the a priori changes and adapts itself to scientific development, and no longer possesses the rigidity that characterized it in Kantian conception.[28] Fries' judgment was: "Kant aber machte den großen Fehler, dass er die transzendentale Erkenntnis für eine Art der Erkenntnis a priori und zwar der philosophischen hielt, und ihre empirische psychologische Natur verkannte".[29]

Fries' project was to define a systematic science of man provided with the clarity and rigor of mathematics. According to him, anthropology was a very general science because it encompasses the study of the most profound human needs, such as art and human action, as

[28] Recently a similar conception of relativized a priori has been developed by Michael Friedmann in *Dynamics of Reason. The 1999 Kant Lectures at Stanford University* (Stanford, California: CSLI Publications, 2001). The original Kantian conception of a priori combined two distinct meanings within a same concept: on the one hand, necessity, unrevisability, apodictic certainty and, on the other hand, the constitutivity of the concept of the object of the scientific knowledge. The notion of relativized a priori makes it possible to acknowledge this duplicity of meanings and to provide the notion of a priori with the *constitutive* character but not with that of *necessity*. Although mathematical and physical a priori principles change and develop along with the continuous progress of empirical natural sciences, they do not drop their constitutive character. For another perspective on relativized a priori see: P. Parrini, *Knowledge and Reality. An Essay in Positive Philosophy* (Dordrecht: Kluwer Academic Press, 1998). In this work Parrini distinguished between transcendental a priori and contextual a priori. The latter interpretation of the Kantian notion of a priori, which is connected to the idea of epistemic relativism, makes it possible to find a third way that overcomes both the radical relativism and the metaphysical realism. On the idea of contextual a priori see also: P. Parrini, *Sapere e interpretare. Per una filosofia e un'oggettività senza fondamenti* (Milan: Guerini e Associati, 2002).

[29] J. F. Fries, *Neue oder anthropologische Kritik der Vernunft* (Heidelberg: Christian Friedrich Minter, 1828), 1st vol., 29.

well as the physiological field. Fries claimed that man lives in two separate and distinct worlds: in the first one, as an organized and living body, and in the other, as consciousness. The goal is to make both worlds the object of a science that could account for man as a whole. Fries outlined three anthropological sciences: the first, called medical anthropology or physiology, takes as its subject the human body in all its natural functions; the second, consisting of empirical psychology but defined by Fries as psychic anthropology, focuses on human interiority as its subject-matter; Fries' third anthropology takes as its subject-matter the comparison of the first two. Fries defined the connection (*Verbindung*) between the two scientific explorations of man as philosophical or comparative anthropology. In other words, the subject of physiological anthropology is the matter and the subject of psychic anthropology is the activities of human mind. Although the organization of the body and the mental states are strongly interdependent (*wechselseitige Abhängigkeit*), the two realms do not mingle (*vermischen*), since each of them is based on its own closed circle of perceptions (*geschlossene Kreise von Wahrnehmungen*). In Fries' own words:

> so interessant daher auch eine allgemeine Untersuchung ist, welche die Beschaffenheiten und Zustände des Geistes, so wie sie innerlich erkannt werden, mit den ihr korrespondierenden Organen und Bewegungen des Körpers vergleicht: so ist die Untersuchung der Natur unsers Geistes doch nicht in einer solchen Abhängigkeit von der Erforschung der Natur des durch denselben belebten Körpers, dass nicht die eine ohne die andere auch sollte stattfinden können.[30]

It is clear from the above remarks that Fries could not and did not accept the reductionist position. In his anthropology, the mental and the physical worlds are of the same order and neither one can be subordinated or reduced to the other. At the same time, it must be pointed

[30] *Ibid.*, 34.

out that the very mechanical-mathematical methodology that allowed Fries to advance his science of man postulates a man that is profoundly and intrinsically linked to physical-mathematical understanding of reality. Fries' non-reductionist idea of human mind left no space for teleological reflection. It is precisely for this reason that Lotze criticized Fries' conception, which did not deal with the deeper questions of philosophy. It is the challenge that Lotze took on in his work, by trying to reconcile the mechanical-mathematical methodological approach with the metaphysical principle of teleology.

4. Hermann Lotze on the relation between body and mind

Using Kant and Fries' discussions as a springboard, Lotze first addressed the problem of the accordance (*Vermittlung*) of mechanism with teleology in his 1838 first dissertation in philosophy *De futurae biologiae principiis philosophicis*.[1]

According to Lotze, the various processes and movements described in the physical, biological, and psychological fields could all potentially be considered in a mechanical perspective. This principle allowed Lotze to avoid recourse to metaphysical entities, such as the vital force, in describing the processes that take place in the sphere of organic beings.

Lotze, who was trained in medicine, was convinced that experimental science and its mechanical method were necessary to tackle the problems of reality. In this connection, it is important to note that certain dimensions of human existence (for example, mental and emotional life, free will) cannot be fully explained through a set of rigid mechanical assumptions; in other words, these spheres resist understanding in a fully mechanical framework. Mechanical-mathematical *description* in terms of natural laws is not sufficient to achieve a true understanding of this higher and essential level of being; we must reach instead a genuine *explanation* of the significance of these processes. To this end, it is necessary to operate at the level of metaphysics and teleology. Precisely this shift from description to explanation—interpreted by Lotze as an upward movement from the methodological principle of mechanism to the explanatory and metaphysical principle of teleology—was at the core of the arguments that drove his biological and psychological works as well as his

[1] R. H. Lotze, *De futurae biologiae principiis philosophicis* (Leipzig: Typis Breitkopfio-Haertelianis, 1838); repr. in: *Kleine Schriften*, 1st vol., (Leipzig: Hirzel, 1885), 1–25.

more strictly medical works on pathology and physiology. This core argument gave rise to the central concern of Lotzean thought: the need for a reconciliation between the scientific description of the world (i.e. what is available to sense perception) and what lies beyond the sensible, or, to keep with Lotzean terminology, what lies above it. Lotze addressed this need for reconciliation specifically in the "Vorbemerkungen des Verfassers" of his *Mikrokosmos*, where he formulated the problem in the following terms:

> But all the same it is in such mediation alone that the true source of the life of science is to be found; not indeed in admitting now a fragment of the one view and now a fragment of the other, but in showing how *absolutely universal is the extent* and at the same time how *completely subordinate the significance, of the mission which mechanism has to fulfil in the structure of the world.*[2]

Here, Lotze resolved the apparent discord between mechanism and teleology, by affirming that mechanism is not a metaphysical principle but simply a methodological principle of natural sciences. The mechanical methodology is a descriptive means to a better understanding of what takes place in reality, but it does not capture the essence of reality nor the higher level of being. Mechanism does not explain the origin of human mental life—understood in the sense of the higher functions of the intellect—nor does it explain the free will or the purposiveness of nature. In other words, Lotze conceived the mechanical description of natural processes as merely a means by which the different purposes of nature are realized within reality.

[2] R. H. Lotze, *Mikrokosmos. Ideen zur Naturgeschichte und Geschichte der Menschheit. Versuch einer Anthropologie* (Leipzig: S. Hirzel, 1856–1864); new ed., *Mikrokosmos*, Nikolay Milkov (ed.), (Hamburg: Felix Meiner Verlag, 2017), XIII*; english trans., *Microcosmus: An Essay Concerning Man and his Relation to the World*, E. Hamilton and E. E. Constance Jones (trans.), (Edinburgh: Clark, 1885), 2 vol., xvi.

When Lotze published his 1838 dissertation *De futurae biologiae principiis philosophicis*, at the end of his medical studies, he had come to consider philosophy as a mode of reflection on the basic concepts of the different sciences. This line of philosophical inquiry globally characterized Lotze's thought, shaping the fundamental problems that he addressed throughout his career.

In the field of biology, for example, Lotze showed that the lack of philosophical reflection gave rise to errors, and argued for the need to overcome "philosophy of nature" of the German Idealists, which, in its present form, hindered progress in both biology and pathology. Philosophy of nature's of the German Idealists mistake, according to Lotze, consisted in taking "*rerum signa*" as laws of nature rather than simply to see them as images or metaphors.[3] Due to this mistake, biology was considered fundamentally different, *qua* science, from physics: whereas the latter mathematically formulated its own laws and thereby generated scientific knowledge, the former's use of the terminology of philosophy of nature of the German Idealists relegated it to the world of *rerum signa* and vital force.

Lotze understood nature as both an organic and an inorganic system; these two systems together constituted all the natural processes whose unvarying forms we understand as natural laws. In Lotze's view, the laws of mechanism, operating in accordance with the forces of attraction and repulsion, are valid not only for the inorganic system, but for all phenomena and processes. That is why, Lotze's reflections on the fundamental concepts of biology gave rise to formulations and suggestions that are valid across all the sciences. Importantly enough, this unified approach was primarily aimed at investigating the meaning of natural laws in general. That is why, in the course of his argument, Lotze demonstrated that biology is, in fact, a science under the same definition as physics, and dismissed obscure concepts,

[3] See: Lotze R. H., *Kleine Schriften*, 1st vol., (Leipzig: Hirzel, 1885), 3.

such as vital force, that lack explanatory power. Indeed, Lotze criticized physiologists, who adopted the Aristotelian notion of "power (δύναμις)" to support their explanations and who claimed that the smallest particles of the body are formed through the organic action of the mystical vital force rather than in accordance with the physical laws of chemistry. Lotze considered this application as incorrect.

Aristotle's *power* was proposed not only to extend mechanism to the organic system of living beings, but also to overcome the limits of this system and to integrate all its lacunae. Lotze argued that, although all processes take place according to the laws of the mechanical-mathematical system, this mechanical system is nevertheless incapable of explaining or justifying the application of *power* to things. In other words, mechanism fails to specify why—among the many processes possible under the same laws—*this* particular event occurs.[4] As such, in a mechanical perspective, the realization of *this* one individual seemed merely to be the result of an absolute predestination. However, whereas the mechanical system belongs to the realm of necessity, all organic things have a contingent beginning. Mechanical force does not act spontaneously; it must have some external cause.

The open question here is why things and processes assume specific forms. Force is measured according to the movement that it exerts in a given trajectory; however, when the effect of force is not a mathematically definable movement but a complex of movements organized by a "transcendent image", we are no longer in the presence of an efficient force,

[4] In his 1838 Dissertation, Lotze referred to Pythagoras as regards the universal extension of the mechanical-mathematical system and to Empedocles with regard to the formulation of the problem of the individual. The morphological issue, that concerns the individual form of living beings, poses the following question: if, under mechanical laws, many events and processes are possible, why does only *this* event come to be real? Why is only *this* event provided with *this* specific and individual form?

but of a "quid" that determines the order of the said complex.[5] The force exerts a movement in a certain direction, which is given by the goal to be realized. This goal is the *organic power*, which is the true engine driving all events. The *power* provides reality with the grounds of the given movement, that is, the necessary individual specificity that secures the occurrence of exactly *this* event as opposed to any other. The internal requirements of this individual specificity determine the choice from among the various forms of phenomena and of mathematically-possible forces appropriate for the realization of that choice.

In Lotze's view, mechanism cannot be confined to the inorganic system alone; it is valid in the organic system as well. If this condition is not secured, the concept of mechanism would be radically impoverished. However, the effective connection between organic power and efficient forces, that is, between dynamic laws and mechanical processes, needed to be justified rationally. To this end, Lotze *prima facie* affirmed that, at the outset, reality receives its specific form from an organic power and is at the same time made eternal by the mathematical necessity of the mechanical system. He then invoked both physiology and the

[5] The term "image" has Herbartian provenance. Herbart claimed in *Hauptpunkte der Metaphysik* that: "What is thought of as having being is called essence. What is torn away from being and thought of only as something is to be called image (intelligent design). The image is not what is formed; for the image to be as an image would require a new being—an imagining—an intelligence." J. F. Herbart, *Sämtliche Werke*, 2nd vol. (Aalen: Scientia Verlag, 1964), 190. ["Was als seyend gedacht wird, heißt insofern ein Wesen. Losgerissen hingegen vom Seyn, bloß als Was gedacht, soll es die Benennung: Bild, erhalten. Das Bild ist nicht, was in ihm gebildet wird; sollte es seyn als Bild, so bedürfte es dazu eines neuen Seyn,—eines Bildenden, einer Intelligenz."]. Herbart's realism consisted in granting nothing more than the empirical world, without any further addition: e.g. actions at a distance or absolute space. At the same time, he conceded that this empirical world can be the object of thought, which renders it as an image, as an appearance, to an intelligible world in which nothing new is added but everything is subjected to the critical analysis of intelligence, which represents the possible ways of assembling and disassembling empirical reality, constructing it in one way rather than another.

concept of striving (*Streben*) to support this argument. Processes come into existence through striving; only one process, out of many possibilities, is realized. Exactly the organic power provides the possible processes with the condition to realize themselves. Bodies are nothing more than organized systems of striving, which can be investigated not through speculative philosophy, but through experiments and observations. Striving is the medium whereby the dynamic and mechanical systems are connected; it constitutes their inseparability.

Striving is the combination of an impulse and the irritability of the body that receives it; thus irritability is the primary property of dynamism, much in the same way that the equipollence of action and reaction is the primary property of mechanism. The impulse transmitted from the mechanical system to the dynamic one is recognized by the latter as a way of reaction. The reaction starts from an irritability, with a striving that sets out an action internal to the dynamic system. Mechanism and dynamism are thus united in an action of mutual exchange for the purposiveness of reality: dynamic forms stimulate mechanical ones to conform to the finality summed up in the totality of the movements and vicissitudes of reality.

Lotze referred to this new system by the Leibnizian term "Systema harmoniae praestabilitae", based on the reciprocal exchange between mechanism and dynamism aimed at realizing the purposiveness of nature. Leibniz had stated in his *Monadologie* (§§ 78–79–81) that:

> These principles have given me a way of naturally explaining the union, or rather the agreement, of the soul and the organic body. The soul follows its own laws, and the body likewise follows its own, and they coincide by virtue of the pre-established harmony between all substances, since they are all representations of one and the same universe. Souls act according to the laws of final causes through appetitions, ends, and means. Bodies act according to the laws of efficient causes, or laws of motion. And the two kingdoms, that of efficient and that of final causes, are in harmony with each another. […] This system means that bodies

act as if there were no souls (although this is impossible), and souls act as if there were no bodies, and both act as if each influenced the other.[6]

Lotze considered Leibniz as a thinker whose thoughts in philosophy were still theoretically valid and whose ideas, such as those of the possible and the individual, had been fundamental and helpful to Lotze's own thought. For Lotze, for example, "harmony" was the immanent engine of all events; it is characteristic both for mechanical and for dynamic systems. It is by means of harmony that the mechanical system stimulates the dynamic one to react through irritability and striving, which, in turn, exert a regulatory action on the mechanical system. The qualitative component of reality appears in tandem with the quantitative; sensibility appears in tandem with mechanical-mathematical causality. The body, which is dynamically constituted of irritability and striving, is affected by external impulses which do not work as mere efficient forces, but rather as an occasion for spontaneous action. In this case, the causal chain is broken and human sensibility shows its freely productive capacity. This capacity means that the body does not react rigidly to the efficient force coming from the external stimulus, but this latter simply excites the body, which through irritability and effort 'responds' actively and productively and not merely mechanically. The dynamic system, which constitutes the deepest aspect of mechanism, provides reality with an autonomous and self-regulating capacity for movement. Sensibility is the site where mechanism and dynamism meet and connect. In short, according to Lotze, before any real progress can be made in the science of life, the following conditions are to be observed: that mechanical processes are the foundation of everything that happens; that no

[6] Leibniz G. W., *Principes de la Nature et de la Grace fondés en Raison, Principes de la Philosophie ou Monadologie* (Paris: Presses Universitaires de France, 1954), 119; english transl: *Leibniz's Monadology. A New Translation and Guide*, Lloyd Strickland (trans.), (Edinburgh University Press, 2014), 30.

physical process occurs independently of an organic stimulus; and that, although nature reaches its goal through mechanical forces, those forces are mediated by the dynamic system. Only by appealing to experience is it possible to show which physical processes occur in organisms and on the basis of which laws. From there, it is possible to explain the links between these processes and dynamic efforts and to enumerate the dynamic efforts so as to show not only the specific mechanical forces at work, but the profound ways in which they are connected to each other, as well as to the whole. In Lotze's words:

> Dynamice nervos agere nos quoque concedimus, neque tamen consentanei illis dynamicam actionem excludere leges mathematicas fingimus, sed restituta potius illa notione ad significationem pristino valore Aristotelico non prorsus indignam, videbimus, quomodo dynamis ad aequilibrium systematis mechanici habeat.[7]

In 1852, Lotze published the *Medicinische Psychologie oder Physiologie der Seele* in which he developed his thoughts for a physiological psychology. In this work, Lotze took into account the project of Herbart and Moritz Wilhelm Drobisch for a "Psychologie als Wissenschaft" which conceived the mind as a center producing representations aimed at its own self-preservation. At the same time, however, he granted a prime importance to the contemporary physiological research on the dynamics of the sensory processes. Much as he had done in his 1838 Latin dissertation and his contributions to Wagner's *Handwörterbuch der Physiologie*, in this book Lotze also addressed the relationship between psychical and

[7] Lotze R. H., *Kleine Schriften*, 1st vol., (Leipzig: Hirzel, 1885), 11. "We also grant that nerves act dynamically, thus rejecting the idea that mathematical laws exclude dynamic effects. If we resort to that concept, whose meaning is thus not far from its original Aristotelian sense, we see a relationship between the dynamics and the equilibrium of the mechanical system." (translation mine—Michele Vagnetti)

physical events, acknowledging their constant connection and once again elaborating his occasionalist vision. As previously stated, Lotze shared the idea of scientificizing psychology, but disagreed with Herbart and Drobisch on the type of science that psychology should take as its model: according to Herbart, psychology should direct itself to mathematics in order to reach the status of science, whereas, according to Lotze, it should follow physiological science. In Lotze's view, the core of Herbart's arguments on the mechanics of the mind was fallacious since it is not representations that vary in intensity but their content, which, however, has an empirical origin. Thus, Lotze rejected any possibility of reconstructing human mental life mathematically.

4.1. Pilosophical psychology and perspectivism

The scientific research of the first half of the nineteenth century had showed the complexity of a purely physiological explanation of the process of perception and presented the difficulty of distinguishing between the purely physiological and the psychological aspect which is fundamental for the process of perception. The *Medicinische Psychologie: oder Physiologie der Seele* (1852) was based on this new knowledge related to the subject of the mind-body relation.

Given the great progress of scientific research, the physiology of bodily life (*Physiologie des körperlichen Lebens*) and the physiology of mental life (*Physiologie des geistigen Lebens*) could facilitate the medical studies on a field that had been of purely philosophical importance until then: the relation between body and mind (*das Verhältnis zwischen Körper und Seele*).

Lotze's physiological psychology attempted to balance between the results of scientific research and the philosophical knowledge. Lotze was profoundly convinced that the facts of experience (*Thatsachen der Erfahrung*) are important and central and that they constitute the scientific contents. However, these scientific contents can be captured in a unitary and

general vision only through the philosophical-metaphysical knowledge which Lotze called the principle of criticism, or principle of judging (*Principien der Beurtheilung*).

The real subject of Lotze's research was the concrete laws that underlie the mind-body relationship, understood as "connection of appearances" (*Zusammenhang der Erscheinungen*). (This last expression will be explained in the course of the discussion below.) According to his philosophical view—i.e., that the various data of scientific observation can be brought together in a unitary view only by the metaphysical knowledge about the course of things—Lotze stated that the laws that govern the mind-body relationship can be found neither by pure speculation nor only by microscopic observation. They can be identified only in a self-reflecting observation (*reflectirende Beobachtung*). An observation that starts from speculative principles under which the observational facts (*Thatsachen des Augenscheins*) are subsumed.

At this point, Lotze's general theoretical picture becomes more clear. He considered the philosophical and metaphysical knowledge of the course of events as the solid basis on which it was possible to build psychological research. Lotze maintained that there is a clear link (*Anknüpfung*) between concrete science and philosophical knowledge. In this sense he spoke about philosophical psychology.[8]

According to Lotze, philosophy had a constructive role: it constructs, based on concepts, particular facts or large portions of reality.[9] These conceptual constructions underlie our

[8] On the idea of *philosophical psychology* in Lotze see: *Kleine Schriften* (Leipzig: Hirzel, 1891), 3rd vol., 1ff.

[9] The third rule of the Cartesian method states that starting with simple and easy-to-understand objects, which for Lotze are the concepts, we can reach step by steps knowledge of more complex objects.

general conviction of the concatenation of things (*Zusammenhang der Dinge*)[10] which is the basis for a concrete scientific research. Philosophy and science cannot operate separately, because the former prepares the foundations whereas sciences construct their particular knowledge on the solidity of this basis.

Lotze considered philosophy as strictly foundational *vis-à-vis* science because it provides the main coordinates with regard to the concatenations of things on which the concrete scientific knowledge develops. It is now clear that Lotze's interest was to demonstrate that the foundations of all human knowledge—i.e., philosophical knowledge divided into its various systems—are not self-contradictory.

In Lotze's view, the various philosophical schools did not contradict each other. Their contradictory nature is only apparent (*scheinbar*)—their products of thought were only different ways of conceiving the same reality, different expressions and perspectives on the same thought. Similarly to Hegel,[11] according to Lotze, the history of philosophy is not a set

[10] It is discussed in R. H. Lotze, *Mikrokosmus. Ideen zur Naturgeschichte und Geschichte der Menschheit. Versuch einer Anthropologie* (Leipzig: S. Hirzel, 1856–1864); new ed., *Mikrokosmos*, Nikolay Milkov (ed.), (Hamburg: Felix Meiner Verlag, 2017), III, 9th book; english trans., *Microcosmus: An Essay Concerning Man and his Relation to the World*, E. Hamilton and E. E. Constance Jones (trans.), (Edinburgh: Clark, 1885), 2 vols., 2 vol.

[11] See G. W. F. Hegel, *Enzyklopädie der philosophischen Wissenschaften im Grundrisse* (Heidelberg: Verwaltung des Oswaldschen Verlags, C. F. Winter, 1830), third ed., § 13. In that paragraph Hegel made the distinction between external history (*äußerliche Geschichte*) of philosophy and the "true" History of Philosophy. According to the external history, the various philosophical systems follow each other by accident, as if their principles were different and unconnected. According to Hegel, there is not a diversity of principles but a single living and thinking Mind (*der Eine lebendige denkende Geist*), which brings to self-consciousness what it is. The History of Philosophy shows that there is only one philosophy and that actually the particular

of contradictory systems but a set of very different systems referring to the same universe (*Weltall*) whose fundamental features (*Hauptzüge*) are clear, from whatever point of view.[12]

Lotze conceived reality (*Wirklichkeit*) as a whole (*Ganzes*) that can be grasped from different points of view (*Standpunkte*). In fact, in *Mikrokosmos* he stated that:

> The traveller who goes round about a mountain, if he goes repeatedly backwards and forwards and up and down, sees a number of different profiles of the mountain recur in an order which might have been foretold. None of them is the true form of the mountain, but all are real projections of it. But the true figure itself, as well as all these apparent ones, would consist in some relation of all its parts to one another. This true figure, the actual inner relation of things, may perhaps also be discovered, and then, of course, this true objective law of reality would be preferred to all derivative and merely partial though valid expressions of it; meanwhile we comfort ourselves with the thought that the nature of truth is such as to make possible innumerable apparent manifestations of itself, and a valid movement of knowledge from one to the other.[13]

---

principles, on which each philosophical system is based, are not different—as external history argues for—but they are rather branches (*Zweige*) of a single Whole (*das Ganze*).

[12] In order to make his idea of perspectivism even clearer, Lotze proposed the metaphor of the geometer; see: R. H. Lotze, *Kleine Schriften* (Leipzig: Hirzel, 1891), 3rd vol., 3.

[13] R. H. Lotze, *Mikrokosmos*, 3rd vol., 217; engl. trans., II vol., 334–35; see: F. Baab, *Die kleine Welt. Hermann Lotzes Mikrokosmos: Die Anfänge der Philosophie des Geistes im Kontext des Materialismusstreits* (Hamburg: Felix Meiner Verlag, 2018), 131n. The metaphor of the traveller (*Wanderer*) was very popular among the German philosophers at that time. Baab refers to Thomas Borgard's hypothesis, according to which Lotze would have taken this metaphor from his friend and mentor Ernst Friedrich Apelt. The latter had used it in *Die Epochen der Geschichte der Menschheit* (Jena: Mauke, 1845–46). According to Gottfried Gabriel, Gottlob Frege also used this metaphor in his early writings (see: G. Gabriel, "Einleitung des Herausgebers: Objektivität, Logik und Erkenntnistheorie bei Lotze und Frege", in *H. R. Lotze, Logik, Drittes Buch. Vom Erkennen (Methodologie)*, (Hamburg: Meiner, 1989b), xi–xxxiv, xvi).

As Florian Baab has reminded us, the object of Lotze's perspectivism was the human being, considered both as the object and as the subject of perception, both as the object of the natural sciences and as that of the sciences of the mind, and, again, both as a social individual, subject to the historical course and as an individual (or nature) tending to truth and the highest values. It is this aspect that gave rise to oppositions and apparent contradictions between the different philosophical systems—idealistic, materialistic, mechanistic, or finalist; they were rooted in the conflictual character of human nature. According to Lotze, the only way to a solution of the conflict between the various philosophical systems lies in the idea that the perspectives of the human nature are so heterogeneous that this latter cannot be exhaustively contained within a single system. Therefore, each system is only a particular point of view on human nature. If we really want to overcome any partial and one-sided philosophical and scientific account of truth (*einseitige Wahrheit*) and to reach a general perspective on the nature of man, we must consider these different points of view as mutually related. Only this approach can allow us to reach that ideal of knowledge of human nature as a whole that runs through Lotze's thought.[14]

As Nikolay Milkov has reminded us, Lotzean 'teleomechanism' also derived from his perspectivism. If our point of view on man is scientific, only mechanistic descriptions are allowed; but, if we assume a metaphysical point of view, they are no longer valid. Metaphysics requires teleological explanations. Milkov wrote that:

> It is easy to see this double-demand for mechanism and teleology as contradictory, so long as one fails to recognize that each demand is a "methodological" demand only, made by the requirements of two disciplines with differing norms and purposes. Similarly, the idealistic tendencies of his system were part of

[14] See: F. Baab, *op. cit.*, 185–88.

> a psychological description of reality, "a personal manner of reading things, a poetic intuition of the cosmic life" (Santayana 1889, 155). Other aspects of his system—like his atomism—were radically objectivistic, suited only to the demands of scientific description and scientific work.[15]

In order to understand the function of perspectivism in Lotze's thought, we can consider § 14 [realistic and idealistic conceptions (*Realistische und idealistische Auffassungen*)] of the *Medicinische Psychologie*, in which Lotze dealt with the realistic (Herbart) and idealistic (Hegel) points of view in psychology.[16] According to Lotze, these two philosophical perspectives simply have different finalities and, therefore, there is the possibility of mutual "coexistence" without contradiction.[17]

In Lotze's opinion, these two points of view—of Herbart and of Hegel—interpreted the same subject, that is, the multiplicity of the empirical world (*Welt der Erfahrung*), but in two radically different ways. Realism considered empirical multiplicity as appearance (*Erscheinung*) and idealism as consequence (*Consequenz*) of an absolute essence or idea. The realistic point of view stated that what appears corresponds to what it is (*so wie scheint, so wie sein*), whereas Hegel's idealism conceived the world of experience as relative and depending on the absolute idea. Realism resolved the contradiction of appearances in a realm of invariableness (*Unveränderlichkeit*), simplicity (*Einfachkeit*) and unrelatedness (*Beziehungslosigkeit*) of real essences; idealism imagined an ideal level beyond appearances. As we said, the possibility of making these two systems coexist without contradiction is given by the fact that they had different finalities. The objective of Herbart's system was to

[15] N. Milkov, "Rudolph Hermann Lotze (1817–1881)", *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/lotze/.

[16] See: R. H. Lotze, *Medicinische Psychologie*, 151–60.

[17] R. H. Lotze, *Kleine Schriften*, 1891, 3rd vol., 9.

show that beyond empirical variability and contradiction there is a true invariable and absolute structure: the 'real' structure that Herbart called *die Welt der Dinge*. The aim of Hegel's system was to found the whole *Welt der Erfahrung* on an 'ideal' rather than 'real' level.

According to Herbart, this metaphysical world of things—which is the structure of the empirical one—is constituted of real essences. Even the mind is conceived as an invariable real essence tending towards self-preservation. In brief, Herbart, too, conceived the mind as something simple, unrelated and invariable. Lotze criticized this idea of Herbart, considering impossible to reconcile the absolute simplicity of the mind with the multiplicity of representations of the mind.

Lotze sought a mediation (*Vermittlung*) between invariableness (*Unveränderlichkeit*) and mental life (*Seelenleben*). He wrote:

> Deshalb wollen wir gegenüber den künstlichen Versuchen, Unveränderlichkeit und Leben zu vermitteln, lieber die Behauptung wagen, die Seele sei nothwendig ein veränderliches Subject der Erscheinungen, müsste sie auch um deswillen als ein Seiendes von bedingter Setzung, nicht aber als Substanz in dem eminenten Sinne des Realismus bezeichnet werden. Wohl werden gegen diese Veränderlichkeit auch andere Einwürfe erhoben, aus der Besorgniss herrührend, dass die Einheit der Persönlichkeit zu Grunde gehen möge, die wir durch unser ganzes wechselvolles Leben als fortbestehend zu behaupten, sittliche Aufforderungen fühlen. Aber wenn wir die Seele für veränderlich halten, so sagen wir weder, dass sie in beständiger Veränderung begriffen, noch dass der Wechsel ihrer Zustände regellos sei. Zwar müssten wir zugeben, dass sie nach unserer Meinung in jedem Augenblicke gewissermassen ein neues und anderes Wesen sein könne, aber dennoch würden die verschiedenen Augenblicke Glieder einer zusammenhängenden Entwicklung und die Seele jedes Momentes die Consequenz der Seele aller früheren Momente sein. Inwiefern sittliche Gründe nun eine andere Identität der Persönlichkeit, als diese, erfordern könnten, würde

> ich ebenso wenig begreifen, als wie der Realismus trotz seiner Hypothese einer unveränderlichen *Substanz* der Seele es anfangen sollte, eine noch grössere Constanz der persönlichen Individualität zu gewähren.[18]

A fundamental element of the realistic conception of the world was, according to Lotze, the centrality of the causal description of the origin of the phenomenon, based on the set of all the initial conditions of the elements involved as well as on the nature of their relationships.[19]

On the contrary, Idealism aimed at something different. Hegel conceived the world as a whole (*als ein Ganzes*), as an implication of an absolute idea and did not care about concrete and empirical sciences. Lotze stated that:

> Causale Untersuchungen lagen daher überhaupt nicht in der Richtung dieses Philosophirens [Hegels], und die Absurditäten, die so zahlreich entstehen, wenn man seine Interpretationen des Sinnes der Erscheinungen für Angaben ihrer Verwirklichungsweise ansieht, beruhen auf einem Missverstande der ganzen Absicht, dessen sich allerdings Hegel selbst zuweilen schuldig machte.[20]

Apparently, the possibility of the non-contradictory coexistence of idealism and realism consists in the Lotze's peculiar attitude towards both of them. On the one hand, he rejected the idea of realism according to which the structure of the world is 'real'; on the other hand he embraced the constant attention of realism to the concrete scientific research; similarly, while accepting the idealistic conviction that the structure of the world is 'ideal', he rejected

[18] R. H. Lotze, *Medicinische Psychologie*, 155.

[19] See: *ibid.*, 156.

[20] *Ibid.*, 157.

Hegelism, since it deprived this ideal structure of its concrete content so that this structure was no longer 'ideal' but had become an 'idea' in its pure formal sense.[21]

Lotze's conclusion was that Hegelian psychology was one-sided. It ended at the history of the development of the pure form of the mind regardless of the concrete scientific data.[22] Precisely for this reason, idealism in its Hegelian version was useless for a concrete psychological research.

At the end, Lotze's point of view becomes completely clear. On the one hand the constant attention to the concrete data of scientific research, and on the other hand the centrality of philosophical-speculative principles capable of organizing in coherent ways the contents that the empirical and concrete sciences provide. This non-contradictory coexistence between speculative ideals and scientific content eventually results in the idea of self-reflecting observation (*reflectirende Beobachtung*), the only possible guide in psychological studies.

4.2. Physiological psychology between materialism and mentalism[23]

The fundamental problem that recurs in *Medicinische Psychologie* is the question of the mental phenomena (*psychische Erscheinungen*). Lotze started his psychological reflection

[21] The role of *idealities* is fundamental in Lotze's thinking. Consider the logical concept of *Geltung*, the ideality of space, the ideality of his atomism.

[22] "Unmöglich ist es daher a priori zu bestimmen, welchen allgemeinen Gesetzen die Thätigkeit der Seele folgen werde; sie müssen rückwärts aus der Erfahrung erschlossen werden, der auch der Realismus Alles verdankt, was er ausser den unbrauchbaren Folgerungen aus dem Begriff der Substantialität seinen Erklärungen zu Grunde legt." (Lotze, *Medicinische Psychologie*, 160).

[23] I translate the German term "Spiritualismus" with "mentalism" for three reasons: (i) Today, the term "spiritualism" is mainly a term of parapsychology which means "belief that the spirits of the dead exist". (ii) In the 170

from the question of mental states: are they produced by a psychic principle of the mind without any bodily action, or are such mental states produced from a cooperation (*Zusammenwirken*) between the physical forces of the body and the life of the mind?[24]

The concept of the mind as a necessity of the unity of consciousness (*Einheit des Bewusstseins*) and as principle of mental states is based on the idea of its incomparability (*Unvergleichbarkeit*) with physical events.[25] Clearly, starting from this point of view, it is not possible to conceive psychology as close to natural sciences—using the results of physiological research. To be sure, it is not possible to reconstruct the unity of consciousness on the basis of physical and mental states cooperating together. A mind composed of specific states appears rather as a simple aggregate than as a unity.[26]

With regard to the question of the subject of psychology, that is, the exchange relations (*Wechselverhältnisse*) between body and mind, Lotze outlined three possible points of view: materialism, the identity of real and ideal, and mentalism. Materialism embraces the methodological principle of the natural science and refuses to accept the existence of the mind, because such an existence would represent an unjustified duplication of the explanatory principle. Apparently, materialism is rather interested in a unity of the

---

years after Lotze published his *Medicinische Psychologie*, this term failed to impose itself as terminus techniques both in the Germanophone and in the Anglophone literature. (iii) Mainly on pp. 55–65 of his *Medicinische Psychologie*, Lotze used the term "spiritual" (*das Geistige*) in the sense of "primordial reality" (*ursprüngliche Realität*). Usually, however, the German term "Geist" is translated into English with "Mind". Apparently, "mentalism" is a more appropriate translation than "spiritualism".

[24] See: R. H. Lotze, *Medicinische Psychologie oder Physiologie der Seele* (Leipzig: Weidmann'sche Buchhandlung, 1852), 9ff; *Kleine Schriften*, III, 4.

[25] See: R. H. Lotze, *Medicinische Psychologie*, 15.

[26] See: *ibid.*, 18.

explanatory principle of reality—not only by rejecting the existence of a psychic principle but also and especially by considering psychology a natural science. Mental life is an element completely depending on the material elements of the body.[27] Lotze stated that such a position is certainly metaphysical. His metaphysical exploration is motivated by the "fragmentary and naturalistic" knowledge which erroneously affirms that everything can be reduced to the level of experience and intuition of natural sciences.[28] The body has an ontological primacy; the mind is only a secondary effect of brain processes. In fact, materialism disregarded any research based on the deepest and most essential needs of human mind, such as the aesthetic and moral needs. Materialistic positions rejected the immortality of the mind and the free will as well.[29] This is certainly a position opposing Lotze's thought. This explains why he opened his *Medicinische Psychologie* with a harsh criticism against the various forms of materialism.

A second set of points of view (*Ansicht*) on psychology was called by Lotze "identity of the real and ideal" ("*die Identität des Realen und des Idealen*").[30] If materialism did not

[27] See: *ibid.*, 30.

[28] See: *ibid.*, 32.

[29] See: *ibid.*, 35.

[30] *Ibid.*, 45ff. J. J. C. Smart, in *Sensations and Brain Processes* (1959), returns to the identity theory, although in a way radically different from Lotze. Whereas in the identity theory exposed and criticized by Lotze mind and body were conceived as identical, both original and therefore not reducible, the contemporary type identity theory has materialistic intentions. This latter states that reality is matter and affirms the general identity of mind and body, reducing the psychical sphere to the physical substrate. See: Smart, J. J. C., "Sensations and Brain Processes", in *Philosophical Review*, 68, 1959, 141–56; Nagel, T., "Physicalism", in *Philosophical Review* 74, 1965, (July):339–56; Taylor, C., "Mind-body identity, a side issue?", in *Philosophical Review* 76, 1967, (April):201–13; Putnam, H., "The Nature of Mental States", in W. H. Capitan & D. D. Merrill (eds.), *Art, Mind,*

address the deepest and most intimate needs of human mind, this second perspective, defined by Lotze as "aesthetic", was based on the recognition of these needs. Materialism recognized reality only as matter and discarded the requests of the mental being (*Aufopferung des selbständigen geistigen Daseins*). The need for a unity and identity of the real and the ideal is the reason of the double life (*Doppelleben*) of living beings (*beseelter Körper*). The organism is matter and mind; it manifests itself as a chemical-physical process and as a phenomenon of consciousness. According to the theory of identity—exposed and criticized by Lotze,—real and ideal, body and mind are original (*ursprünglich*) and constitute an indissoluble (*unlösbar*) unity. The unity depicted by materialism is quite different, since it takes into account the atoms of matter with their masses and specific properties, and the mental life as simply one of these properties. The mind is a property of matter. The concept of unity belonging to this second point of view is constructed differently. The idealreality is an original unity in which mind and body have the same ontological value.

According to materialism and to the principles of mechanics, mental and bodily life is the result of systems of masses and forces. The supporters of the ideal-reality theory considered the mechanical-materialist conception as an external point of view on reality, because all events were considered as a result of the application of forces to certain material atoms—each of them with its own mass—under certain circumstances. Bodies are understood as simple aggregates of atoms. This conception does not account for the interiority and the sense of totality about things. The theory of identity is the core of Schelling's *Naturphilosophie*, in which the living organism is understood as something absolute that manifests both its bodily

and Religion. (Pittsburgh University Press, 1967); Ravenscroft, I., *Philosophy of Mind. A Beginner's Guide* (Oxford: Oxford University Press, 2005), 39–49; Schneider, S., "Identity Theory", *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/identity/#H3.

and its mental side. This organism, which is simultaneously corporeal and mental, moves according to its own force—*Lebenskraft*, which is inherent in things. Lotze denied the explanatory value of this concept in physiology. According to him, *Lebenskraft* was a mystical force that causes everything and therefore explains nothing.[31] Many physiologists, such as Gottfried Reinhold Treviranus and Johann Heinrich Ferdinand von Autenrieth, employed this concept.[32]

The search for interiority and for a sense of things opens up to the notion of the internal vital force that moves and shapes things. Things are no longer mere objects on which external forces exert their action, but they become the subject of movement. According to Lotze, such a mystical, nebulous and unclear concept is not useful for the scientific research. The organic body cannot have only one cause—vital force—that moves it and shapes it, because the body is an aggregated system of multiple contemporary activities of the constituent elements one towards the other. The physiological research cannot rely on the use of the *Lebenskraft*, because a single absolute force would not be able to explain the multiplicity of forms, sizes and directions charcterizing the molecules that form the organic aggregates. If we consider every single molecule provided with its own vital force, then we have to explain how the

[31] See: R. H. Lotze, "Leben – Lebenskraft", in *Handwörterbuch der Physiologie mir Rücksicht auf physiologische Pathologie*, R. Wagner (ed.), (Braunschweig: Vieweg, 1842), 1st vol., IX–LVIII; *Allgemeine Physiologie des körperlichen Lebens* (Leipzig: Weidmann'sche Buchhandlung, 1851).

[32] G. R. Treviranus, *Die Erscheinungen und Gesetze des organischen Lebens* (Bremen: Heyse, 1831–33), 2 voll. He was a doctor and biologist contemporary with Lamarck. He proposed the theory of transmutation of species which somehow prefigured evolutionism. J. H. F. von Autenrieth, *Ansichten über Natur- und Seelenleben* (Stuttgart und Augsburg: Cotta, 1836). He attended Antonio Scarpa's classes in Pavia and was a student of Johann P. Frank. He was a clinician and professor of anatomy at the University of Tübingen.

universal vital force can coordinate these particular forces.[33] Lotze claimed that the organic body is a means (*Hilfsmittel*) for the activity of the mind.

This second point of view, affirming a unity of the world as connection of real and ideal (*Verknüpfung des Ideellen und Reellen*),[34] is limited. In order to explain the subject-matter of psychology, philosophy and science must cooperate. A philosophical perspective that stresses unity regardless of the mostly unknown determined relations within this unity cannot be helpful for the scientific explanation of the specific psychological facts. In its attempt to explain the psychological facts, science must take into account the relations (*Verhältnisse*) between an extensive size such as the body and an intensive magnitude such as the mind. In fact, only this mutual activity gives rise to the psychical fact. Lotze wrote:

> Wir wollen hier über nicht weitläuftig sein; oft genug werden wir noch Veranlassung finden, die praktische Untauglichkeit der voreiligen Anwendung jenes Identitätsprincips zu rügen, die ein trübes Verlangen nach Einheit wohl auf trübe Weise befriedigt, über die bestimmteren Verhältnisse der Vereinigten dagegen meist unbelehrt lässt.[35]

In short, if the mistake of materialism consist in a radical reduction, that of the theory of identity in the identification of the mind and the organic body. According to Lotze, the need for unity can be satisfied only by the mind.

Another possible point of view on psychology is mentalism, which places reality within the mental sphere. Unlike the first two positions, which did not critically examined the

[33] The concept of vital force is problematic not only from the physiological but also from a logical point of view, see: Lotze, *Medicinische Psychologie*, 53–55.

[34] See: *Kleine Schriften*, 3rd vol., 4–5.

[35] *Medicinische Psychologie*, 26.

original reality of the material principle, mentalism conceived matter as secondary and depending on the mind.[36] Lotze undoubtedly considered himself a mentalist.[37]

Mentalism considers "die Materie als eine Erscheinungsform eines an sich übersinnlichen Realen."[38] Lotze was convinced that, as for psychology, this point of view could not be adopted by science in its practical realization, but that it nevertheless represented a higher perspective on science. In fact, Lotze differentiated between the *ideal of science* and the *practical realization of science*. Science, understood as an ideal, should be able to conceive the determined laws of nature as simple necessary consequences of mental states. Consequently, psychology would be considered as a theory of the fundamental principles of being and action, and physics only as a demonstration of the development of the activity (*Regsamkeit*) of mental life through space and time.

Things are different as to the practical realization of science. This latter must constantly consider the empirical multiplicity given by experience. As an ideal, science presents us a mentalistic monism which represents the highest level of human knowledge, whereas, understood in its practical use, it constantly deals with multiplicity and, in the case of psychology, with the dualism of mind and body. In Lotze's words:

> Noch viel weniger ist es bis jetzt gelungen, die bestimmten Naturgesetze, welche uns die Erfahrung kennen gelehrt hat, als nothwendige Consequenzen innerlicher, geistiger Zustände der Wesen zu fassen. Allerdings müssen wir daher, wenn wir ein Ideal der Wissenschaft in unserm Sinne zeichnen wollen, die Psychologie als die Lehre von den wesentlichen Principien alles Daseins und Wirkens, die Physik dagegen nur als Nachweisung der besondern Formen anführen, welche die Regsamkeit des geistigen Lebens innerhalb des

[36] See: *ibid.*, 55.

[37] See: *Kleine Schriften*, 3rd vol., 5.

[38] *Medicinische Psychologie*, 64.

> Gebietes räumlich zeitlicher Anschauungen entwickelt. Für unsere wirkliche Ausführung der Wissenschaft jedoch müssen wir uns, wie so oft in der lückenvollen menschlichen Erkenntniss begnügen , einerseits dies Princip zu besitzen, anderseits die Fülle der empirischen Mannigfaltigkeit zuerst durch ihnen näher liegende Abstractionen zu beherrschen und sie allmälich erst zur Ableitung aus dem höchsten und wahren Grunde ihrer Existenz vorzubereiten.[39]

Although Lotze agreed with the methods and objectives of science, he nevertheless shaped a philosophy that could strongly oppose to materialism. It is not accidental that from the very first pages of his *Medicinische Psychologie* he criticized materialism and the idea of matter proposed by materialists as an explanatory principle for the life of the mind: "Die Vorstellung der Materie [ist…] das dunkelste und unsicherste Erzeugniss unserer Reflexion".[40]

In particular, he criticized the materialism of Büchner, Moleschott and Vogt. Basing on Flourens' theory of brain localization of psychic functions and from the principle of force conservation, as presented by Hermann Helmholtz in 1847, these authors had argued that our psychic activity is completely produced by the brain and in accordance with the mechanical laws. In their opinion, our psychic activity could be reduced to the mechanical activity of the brain.

Lotze also criticized the "mechanic of mind" (*Mechanik des Geistes*) developed by Herbart and Moritz Wilhelm Drobisch.[41] Their mathematical psychology was ultimately to be refuted. According to Herbart, our representations vary in intensity such that they can be quantified mathematically. In his "Psychologischen Untersuchungen" (1853) Lotze argued against Herbart that there is not a variation of intensity but rather of the content of the

[39] *Ibidem*.

[40] *Ibidem*.

[41] We already spoke about it in § 4.

representations, and the content has an empirical origin, because it is captured through sensation and then reproduced through representation. Intensive magnitudes therefore have to do with sensation, with the physiological sphere, and not with representation. Intensity cannot be excluded from the psyche—emotions, for example, are intensive magnitudes—although it cannot be quantified mathematically.

According to Lotze, attempting to incorporate two attributes so different from each other as the real and the ideal into the single concept of matter would not allow for the explanation of mental life. It would simply create more confusion and give rise to a conception of man which would not provide any unity. Lotze thought that it is rather the idea of mind that can explain mental life and the materiality of human nature. As Lotze wrote:

> Gegen den Materialismus müssen wir behaupten, dass gerade aus jenen Eigenschaften und Wirkungen der Dinge, die wir mit dem Namen der Materialität bezeichnen, das Geistige nie zu erklären sei und deshalb die Psychologie nie sich in Naturwissenschaft verwandeln lasse.[42]

It is clear that Lotze did not believe that matter and mind were identical. He was convinced that the clear separation between body and mind was valid in any practical development of science ("*praktische Ausführung der Wissenschaft*"). For this reason, he raised the problem of the explanation of the interaction between body and mind, developing the idea of a "physical-psychic mechanism".[43] In order to understand the relationship between body and mind, we have to focus on the most important problem: the causal relationship between two radically different substances.

[42] *Ibid.*, 65.

[43] See: *ibidem*.

4.3. The psycho-physical mechanism: the occasionalist way

Lotze dealt with the question of the connection between body and mind (*Zusammenhang zwischen Leib und Seele*) in the sixth paragraph of the *Medicinische Psychologie*. He did not conceive the interaction between body and mind as an efficient causal connection (*causa efficiens*), since there is not a direct action of one matter on the other. The case of psychology presented a basic incomparability (*Unvergleichbarkeit*) between the physical change of a material body and the psychic event of the supernatural mind. An effective causal construction of one state on the other was not possible.[44]

Lotze tried to specify the argument with the help of which natural sciences tried to overcome the difficulty resulting from the incomparability between body and mind. They explicitly mentioned the interaction between *Ponderablen* and *Imponderablen*, stating that the possibility of a mutual influence between body and mind does not require the absolute identity (*Gleichheit*) of the two, but their type identity (*Gleichartigkeit*).[45] Natural sciences widely resorted to this thought, combining in the same causal connection two different natures such as body and mind, whose only similarity would be the spatial existence and the ability to exert driving forces. From this point of view, body and mind were conceived as identical, since their natures have common roots.[46]

The opinion, widely accepted in physiology, according to which bodily states and changes are driven by an immediate impact of certain ideas or types, was rejected by Lotze, because the psychic element is not endowed with a mechanical force sufficient to activate the other

[44] See: *ibid.*, 70ff.

[45] Cf. with the type identity in the current philosophy of mind.

[46] See: *Medicinische Psychologie*, 74.

element, that is, the body.[47] Compared to bodily masses, idealities are forceless shadows. Lotze's solution was the two-fold meaning (*Doppelsinnigkeit*) of the ideal elements. Types and designs of our psychic organization are ideal, because their form of existence is ideal and, as such, the mind opposes the real and material form of the world. At the same time, like matter, human mind also exists in the world and has a positive reality of autonomous existence that gives the ideal the ability to act in the bodily world. Here we have a clear example of the great importance of the method of dialectics to Lotze's philosophical research.[48] Let us read Lotze's own words:

> Die Doppelsinnigkeit dieses Namens darf uns nicht täuschen; jene Typen und Plane der Organisation sind *ideal* in Bezug auf die Form ihres Daseins und im Gegensatz zu der Welt des *Realen*, in der sie, als unwirkliche, nur gedachte oder denkbare Bestimmungen, nicht mitzählen, und auf die sie deshalb unmittelbar kein bewegendes Moment ausüben; die Seele ist *ideal* in Bezug auf die Natur ihres Inhalts und

[47] *Ibidem*.

[48] Lotze attributed to the ideality of psychic organization a double nature: it was both ideal and material. If we consider the life of the mind on the basis of the specific form of existence of its contents, it is clearly ideal. However, if we change our point of view and evaluate the life of the mind on the basis of its ability to act in the material world, it assumes a material character as well. Here the fusion between Hegel's dialectical method and perspectivism is clear. (N. Milkov, "Rudolph Hermann Lotze (1817–1881)", *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/lotze/.) Paul Grimley Kuntz wrote: "There seems to be no sense to why Lotze is sometimes idealistic and sometimes realistic, except that the idealistic passage is from a section on the Soul, and the realistic passage is from a section on the world. But this explanation went counter to Lotze's doctrine of panpsychism: that things are ultimately soul-like. We must shun initially the theory that there were two Hermann Lotzes, for there are some passages in which he does seem conscious of the contradictions and attempts to mediate between the two." (G. Santayana, *Lotze's System of Philosophy*, P. G. Kuntz (ed.), (Bloomington: Indiana University Press, 1971), 34).

> im Gegensatz zu dem *Materialen*, dessen Eigenschaften sie nicht an sich trägt; aber gleich diesem ist sie eine wirklich vorhandene Substanz und genießt in nicht geringerem Grade jene *Realität* des selbständigen Daseins, auf welcher die Fähigkeit beruht, etwas in der Welt in Bewegung zu setzen.[49]

Lotze, therefore, stated that there is a 'dialectical' interaction between the ideal and the material nature and that mind and body are simply two different kinds of reality (*zwei verschiedene Gattungen des Wirklichen*): the movements that take place in one state of reality are transferred to the other without requiring the existence of any effective causal connection (*Causalnexus*) to be postulated. Obviously, the problem of the incomparability ("*Unvergleichbarkeit*") between the physical and mental elements arises again.

Natural sciences explore movements of nature that are comparable (*vergleichbare Bewegungen*). All its states are analytically constructed, starting from the nature of the given conditions of a process, without assuming intermediate elements between the movements. However, it is not possible to imagine a science that explores incomparable elements.[50] Lotze, however, knew that the task of distinguishing the motions of the mind from those of the body, and vice versa, is impossible, once we assume their fundamental incomparability (*Unvergleichbarkeit*). The difficulty of a scientific explanation of this interaction, however, does not mean that it does not exist. On the contrary, according to Lotze, the causal connection between the natures was a fact: we just cannot provide an appropriate explanation.

The imperfect human knowledge of the mediation (*Vermittlungsglieder*) between mind and body, which allows the physical element to become ideal and vice versa, does not hinder

[49] R. H. Lotze, *Medicinische Psychologie*, 75.

[50] See: *ibid.*, 76.

the possibility of its scientific research in general, although it does not allow us to grant psychology the "*construirende* Form der Wissenschaft".[51] The subject-matter of psychology—i.e., the interaction between body and mind—refers to a fundamental irreconcilable dualism. As a result, it is impossible to consider—as natural sciences do—the psycho-physical mechanism as a whole (*Ganzes*) constituted of its simple elements. Dualism, in this realm, is indelible.

Lotze further assumed that both in psyche and matter there are internal properties that can generate intensive states of mind from the impulses of the matter's spatial-temporal movement. Psychology would never be a natural science able to explain how and why the psycho-physical mechanism takes place. There is no formula regarding the foundation of this mechanism. This is a clear sign of Lotze's criticism of Weber and Fechner's measurement paradigm.[52]

Fechner upheld a theory of the body-mind relationship in which mind was connected to the brain at any point. This one-to-one correspondence between body and mind was

[51] *Ibid.*, 77.

[52] See: *ibid.*, 210–11. Fechner's measurement paradigm stated that it is possible to express the general relationship between the bodily and the mental sphere through a mathematical formula. The bodily sphere can be internal (nervous system) and external (physical stimulus). According to internal psychophysics, the intensity of the sensation corresponds to the logarithm of the intensity of the nervous process and, in order that the intensity of a sensation may increase in arithmetical progression, the nervous process must increase in geometrical progression. Only the external bodily sphere (physical stimulus) is directly measurable—and scientifically accessible—even if it is indirectly connected to the mental world, because the transition is mediated by the nervous process. Fechner's mathematical formula is based on direct measurement of the size of the stimulus, as follows: $\Delta S = C \frac{\Delta R}{R}$ (S is sensation, C is a constant of integration and R is stimulus (*Reiz*)). The integration of this formula allows us to find the value of the sensation: $S = \log_c R + C$. The sensation is proportional to the logarithm of the stimulus.

synthesized by Fechner's well-known formula. Lotze criticized Weber and Fechner's formula, considering the mind as based on intensive states—indeed, it is a non-spatial substance. The nervous system, on the other hand, is based on extensive states which are simple signs for the mind. For this reason, Lotze proposed his occasionalistic understanding of the physical-psychic mechanism.

This does not mean that Lotze actually considered his theory to be a positive one, able to *explain* the body–mind mechanism. He rather identified an occasionalist methodological principle that, basing on the admission of our ignorance about the mechanism's effective causal relation as well as on the recognition of the limits of human knowledge, could allow us to practically carry out our scientific research in this field.

In other words, the occasionalist theory of the physical-psychic mechanism does not allow us to explain how a material stimulus, running through bodily sensations, can produce a psychic state. This notwithstanding, we are able to grasp the *correlation* between the external and the internal, that is, between body and mind. As Lotze himself wrote it in *Medicinische Psychologie*:

> Wir können also *nicht* angeben, wie es ein materieller Bewegungsreiz, der unsern Körper trifft, anfangen mag, um einen psychischen Zustand zu erzeugen, wohl aber können wir eine Beantwortung der Frage hoffen, *welche* aussern einfachen Reize tatsachlich mit *welchen* einfachen inneren Zustanden allgemein und gesetzlich verkettet sind, und wie aus der weiteren Zusammensetzung dieser Paare von inneren und aussern Ereignissen das Ganze der Wechselwirkung zwischen Leib und Seele, d. h. das physiologische Seelenleben entstehe. Indem wir aus der Erfahrung die Tatsache entlehnen, dass mit einem durch äussere Reize erzeugten Körperzustand a stets und allgemein ein Seelenzustand α sich verknüpfe, oder dass aus einem Seelenzustand

> b stets konsekutiv ein Körperzustand β folge, sehen wir a und b als Veranlassungen an, an welche der Naturlauf beständig und allgemein die Wirklichkeit von α und β gebunden hat.[53]

According to Lotze, occasionalism was only a methodological and descriptive theory and not a positive—explanatory—theory about the nature of the subject. In fact, this theory cannot achieve true knowledge of its subject. If we want to achieve a true knowledge, we must address metaphysics. It is the only discipline able to explain the nature of this mechanism "even if it does not allow practical use".[54]

The "wahre Theorie" and the "wahre Ansicht" of the body-mind relationship are the above-mentioned mentalistic theories. According to Lotze, mentalism accounted for the truth about the relationship between consciousness and body, despite the fact that this truth is not useful for an effective scientific practice. In summary, we can say that mentalism is true but not useful.[55]

The occasionalist theory arises from the fundamental type-difference (*Ungleichartigkeit*) between body and mind, "welche keine Construction psychischer Zustände aus Bewegungen, sondern nur eine tatsächliche und proportionale Aneinanderkettung beider erlaubte".[56] Employing the language of metaphysics, Lotze stated that materiality and corporeity are nothing more than simple forms of appearance (*Form der Erscheinung*), "welche ein übersinnliches Reales, das dem Wesen der Seele an sich gleichartig ist, unter gewissen

---

[53] *Ibid.*, 77–78.

[54] *Ibid.*, 78. Lotze wrote: "obgleich sie praktisch keine weitere Benutzung gestattet". (Translation mine—Michele Vagnetti)

[55] See: *Kleine Schriften*, 3rd vol., 6.

[56] Lotze, *Medicinische Psychologie*, 78.

Umständen für unsere Auffassung annimmt".[57] In this sense, Lotze's metaphysics assumed a mentalistic meaning.

In summary, according to Lotze, the substantial core of matter was supernatural. The simple observation of the relationship between mental states and physical movements does not allow us to explain it as the direct effect of one on the other, because this would contradict the principle of type-difference.

In this sense, if psychic events result from physical events, they are not directly generated by the latter, but by the internal changes of the real, whose shady phase (*Schattenphase*) is constituted by physical processes. Even if psychic states could change the course of physical events, they certainly could not directly influence physical forces and physical states, although they could impact the states of reality, the manifestation of which consists of physical forces and physical states. We should thus explain psychic movements as agents acting not directly upon the body but upon certain deeper and more general states of reality (*Zustände des Realen*) which provide us again, as a manifestation, with body movements and vice-versa.

In addition to the methodological level requested for a physiological psychology, there is also the level of metaphysics that was fundamental to Lotze's philosophical psychology. Leibniz seems to have been the direct source of inspiration of this metaphysical theory. Leibniz affirmed a mind–body dualism in which, however, these two elements are considered as manifestations of a single reality. This reality and all its parts are in constant movement and change, thus preserving its harmonious unity. In this connection Lotze wrote:

[57] *Ibid.*, 79.

> Die Materie, so wie wir sie wahrzunehmen glauben, können wir nur für einen Schatten halten; ein übersinnliches Reales ist auch in ihr der substantielle Kern, welcher den Schatten wirft. Nun wäre es allerdings ein unlösbares Problem, zu zeigen, wie der Schatten eines Körpers unmittelbar eine bewegende Kraft auf einen andern Körper ausüben könnte, oder wie der letztere an jenem Schatten Widerstand genug finden sollte, um umgekehrt ihn in Bewegung zu setzen. Nichts aber ist einfacher, als dass ein Körper, ausserdem dass er Schatten wirft, auch noch einen andern Körper bewege, oder dass er, indem er den andern bewegt, auch den Schatten verändert, den jener warf. Gehen daher psychische Ereignisse aus physischen hervor, so entspringen sie doch nicht aus diesen selbst, sondern aus den innerlichen Veränderungen des Realen, deren Schattenphase jene physischen Vorgänge sind; ändern umgekehrt psychische Einflüsse den Lauf der physischen Begebenheiten ab, so wirkten sie doch nicht unmittelbar auf die physischen Kräfte und Zustände, sondern auf die Zustände des Realen, deren erscheinender Ausfluss jene sind. So kommen wir auf einen physisch-psychischen Mechanismus zurück, in welchem in der That alle Wechselwirkung zwischen gleichartigen Gliedern stattfindet, freilich nicht, indem wir materialistisch die Seele zu einem Stoffe, sondern umgekehrt, indem wir spiritualistisch den Stoff zur Seele oder einer ihr wesentlich homogenen Substanz werden lassen.[58]

Consequently, human being, understood as a microcosm tending to general harmony, can only be studied and analyzed from the perspective of mentalistic metaphysics.

4.4. The psycho-physical mechanism: the interaction

A correct analysis of Lotze's Psycho-Physical Mechanism shows that bodily functions do not directly produce mental states. The activity of the mind is always presupposed and original. The impressions and sensations provide the mind with the object of its applications. The mind activity elaborates the data provided by the body in a not receptive and passive way.[59]

[58] *Ibid.*, 79–80.

[59] See: *ibid.*, 93–94.

Lotze raised the problem of the freedom of the mind, upholding its free constitutive activity.[60] The mechanism at issue is not a fixed series of physical changes accompanied by another fixed series of mental changes: physical events, that stimulate the sense organs, are "read", organized and then transformed by the mind into something purely mental that exerts a new mechanical force and produces new physical changes.

Lotze did not consider physiological psychology as able to determine the freedom of will, which is rather a metaphysical question. Physiological psychology showed that the brain is much more than a mere material object within the path of mechanically predetermined physical movements. It also affirmed the possibility or necessity of properly psychic laws, which constitute the true core of this mechanism. However, physiological psychology cannot go further. Only metaphysics can determine whether the psychic laws regulating the inner states of the mind are similar to the causal, mechanical and deterministic laws, which regulate the course of nature. Lotze maintained that his point of view did not contradict a strong causal connection. There is no break in the causal chain; in Lotze's words:

> Eine allgemeine Bemerkung muss ich jedoch noch hinzufügen. Man muss nicht glauben, dass unsere Ansicht, eben so weit wir sie hier aufgestellt, einem strengen Causalzusammenhang widerspreche. Wenn auch immer an einem gewissen Punkte eine physische Bewegung aufhört, eine neue ähnliche zu erzeugen und in innere Zustände des Realen übergeht, oder wenn an einem andern Punkte dieses Innere sich wieder zum Anfang einer physischen Bewegung gestaltet, so ist doch hier kein Bruch in dem Zusammenhang der Causalität, sondern nur eine Umgestaltung in der Form der Wirkung vorhanden, wie sie denn auch auf dem Gebiete des unbeseelten Naturlaufs häufig genug vorkommt. Wir würden jede Empfindung als ein umgeformtes Aequivalent der Wirkungsgrösse betrachten müssen, die vorher in Gestalt einer Oscillation

[60] See: *ibid.*, 94–97.

> oder einer andern Bewegung vorhanden war; jede Contraction eines Muskels als ein Aequivalent der Erregung, die in der Form eines psychischen Strebungsprocesses voranging.[61]

According to Lotze, when there is a transition from the physical to the mental realm, there is no break in the chain of causation but only a formal change from a muscle contraction to a mental state (*Strebungsprocess*). This transformation (*Umgestaltung*) does not transgress the laws of causation, because the mental sphere is endowed with its own laws. In this way, causation does not lose its universal (with no exception) extension, something that Lotze explained in detail in *Mikrokosmos*.

In *Medicinische Psychologie*, § 25, Lotze contended that the mind is able to develop freely in accordance with its own purposes and to use the muscular movements of its body to achieve its own end.[62] These two positions seem to contradict each other, but, once again, Lotze adopted the two-fold dialectical register of the scientific description and the teleological explanation of the world.

In the interaction between body and mind, as described in Lotze's Principle of Mechanism, while the mind uses the body for the realization of its own ends, the body supports and drives various mental functions. Sensations, intuitions as well as the highest functions of the mind have always a bodily support. Based on the functional form of the particular histological elements, on the convergence of several organs into one, on the proportions between the organs and the different parts of the body, and, finally, on the succession of the various stimuli and stages of the development of the body, this latter drives the formation and combination of human psyche.[63]

---

[61] *Ibid.*, 95.

[62] See: *ibid.*, 296–304.

[63] See: *ibid.*, 97–106.

4.5. Lotze's theory of local signs

As we have seen in § 1.3., the problem of space played a substantial role in Lotze's thinking. But before starting to discuss it, it is important to make a preliminary distinction: space, understood as metaphysical ideality, has nothing to do with the space of our perception. Lotze dealt at large with the perceived space in the *Medicinische Psychologie*. Whereas space, understood from a metaphysical point of view, is a pure extension with an infinite multiplicity of directions, the perceived space has three directions.[64]

Already in the beginning Lotze stated that his position is dualistic and that the external space, understood as geometric form provided with a certain extension and position, turns into a non-spatial and non-material elements and is, in this way, a sum of intensive states of the mind.

This transformation from extensive to intensive perspective led Lotze to state that our vision of space is never a mere reflection of what exists but is always a reproduction.[65] This reproduction is constituted of three factors: the physiological mediation, which Lotze called "local sign", the psychic manifestation, Lotze called it feeling of movement ("*Bewegungsgefühl*"), and the final global vision of space. Lotze clearly rejected the naïve correspondence theory of space, according to which there would be no difference between the space of the external world and that of the mind.[66] Lotze specified that:

[64] On the three directions of the perceived space see: *ibid.*, 333–4 and 417–18.

[65] It is not Kant's idea of space that is innate but it is the mind's organizing activity that is innate and that makes it possible to coordinate and elaborate the sensible data.

[66] See: R. H. Lotze, *Kleine Schriften*, 3rd vol., 12.

> Sollen wir daher eine Anschauung der wirklichen Lage äusserer Objecte gewinnen, so kann es nicht auf dem Wege der *Auffassung*, sondern auf dem der *Wiedererzeugung der Räumlichkeit* sein. Ueberall wird das Extensive in ein Intensives verwandelt, und aus diesem erst muss die Seele eine neue innerliche Raumwelt reconstruiren, in welcher die Bilder der äussern Objecte ihre entsprechenden Stellen finden. So wie eine veränderliche Grösse abnehmen kann bis zu einem Nullwerth und jenseit desselben wieder wachsen, so geht die Regelmässigkeit der geometrisch geordneten Einwirkungen unfehlbar in einem Punkte vollkommner Unräumlichkeit zu Grunde und wird jenseit desselben wiedererzeugt.[67]

In order to face the problem of the reconstruction of the spatiality in general ("*Wiedererzeugung der Räumlichkeit*"), Lotze elaborated his theory of local signs.

When Lotze addressed the topic of our perception of space, he further investigated the problem of psycho-physical occasionalism and tried to find an interrelation between physiology, psychology and the philosophy of mind, in the light of the scientific explanation of our process of perception.

The system of local signs ("*System der Localzeichen*") is a physiological nervous formation that accompanies (*begleiten*) sensations. When I see an external object, this generates a sensation of colour in me. This sensation, said Lotze, is not sufficient to locate spatially the object to which this 'sensory quality' refers. The localization of the object requires an additional (secondary) sensation (*Nebenempfindung*) which carries the spatial information necessary to locate the object, i.e. to locate the stimulated nerve. Thanks to the nerve localization it is possible to place this object in the space "through a sort of projection of the disposition assumed by the sensations of the object's qualities during their manifestation on the epidermis or on the retina".[68] In Lotze's words:

---

[67] Lotze, *Medicinische Psychologie*, 328–9.

[68] S. Poggi, *I sistemi dell'esperienza* (Bologna: Il Mulino, 1977), 517.

> Da nun die spätere Localisation eines Empfindungselementes in der räumlichen Anschauung unabhängig ist von seinem qualitativen Inhalt, so dass in verschiedenen Augenblicken sehr verschiedene Empfindungen die gleichen Stellen unsers Raumbildes füllen können, so muss jede Erregung vermöge des Punktes im Nervensystem, an welchem sie stattfindet, eine eigenthümliche Färbung erhalten, die wir mit dem Namen ihres *Localzeichens* belegen wollen.[69]

This is the physiological basis of our perception of space. As to the visual sense, the oculomotor movements orient the stimulation towards the center of the retina. In this way, the system of local signs is developed. Important pioneer studies on this problem were those by Fries, Volkmann and Marshall Hall.[70] As to touch, the local signs develop in sensory circles in the way showed by E. H. Weber, which Lotze embraced and developed further.

Lotze's fundamental problem was the following. This system of local signs is only a physiological nervous process, an intensive and qualitative 'specific sensory energy' and, as a consequence, it is not provided with an intrinsic spatial order. The spatial order is introduced by the mind. This is the psychological aspect of the representation of space. In Lotze's words:

> Es war indessen auch keineswegs unsere Absicht, aus jenen Localzeichen die Fähigkeit der Seele, *Raum überhaupt* anzuschauen, oder ihre Nöthigung abzuleiten, das Empfundene in diese Anschauung aufzunehmen. Wir setzen vielmehr voraus, dass es in der Natur der Seele Motive gibt, um deren willen sie einer räumlichen Anschauungsform nicht nur *fähig ist*, sondern auch zu ihrer Anwendung auf den Inhalt der Empfindungen *gedrängt wird*; und weder jene Fähigkeit noch diese Nöthigung suchten wir aus den

[69] Lotze, *Medicinische Psychologie*, 330–1.

[70] Cf., J. F. Fries, "Über den optischen Mittelpunkt im menschlichen Auge" (Jena, 1839), in *Sämtliche Schriften*, 5, 411–91; Marshall Hall, *Von den Krankheiten des Nervensystems* (Leipzig, 1842). See: W. R. Woodward, *Hermann Lotze. An Intellectual Biography* (Cambridge: Cambridge University Press, 2015), 211.

> vorausgesetzten physiologischen Verhältnissen jener Localzeichen zu erklären. […] Sind einmal alle geometrischen Verhältnisse, welche zwischen den Theilen der äussern Reize und noch zwischen den ihnen entsprechenden Eindrücken im Nerven bestanden, in dem blos intensiven Dasein verschwunden, welches den Vorstellungen in der Seele allein zukommt, und sollen sie aus diesem reconstruirt werden, so müssen an den einzelnen Empfindungen intensive Merkzeichen angebracht sein, welche die Lage ihrer Objecte im Raume vertreten, und aus welchen die Seele die räumliche Ordnung wiederherstellen kann. […] Wir meinen damit nicht, dass der unendliche nach drei Richtungen ausgedehnte Raum von selbst ein immerwährender Gegenstand unsers Bewusstseins sei, den wir etwa seit unserer Geburt in Gedanken anstierten, begierig, ihn mit Bildern zu füllen. Wir meinen nur, dass die ursprüngliche Natur unsers Geistes uns dazu treibt, unsere Empfindungselemente in räumlichen Lagen zu ordnen, und dass eine spätere Reflexion auf die unendliche Anzahl solcher Anordnungen, die wir unbewusst vorgenommen haben, uns auch die mehr oder minder lebhafte Gesammtanschauung des alle umfassenden unendlichen Raums zum Bewusstsein bringt.[71]

Local signs are nervous, qualitative and intensive elements that differ from each other but require a spatial order which is provided by a mental activity which places them into spatial series. When our nerve structure is stimulated by the outside world, it creates this whole system of local signs through body and muscle movements. These muscle movements are connected with certain psychical states. Muscles have an immediate impression (*unmittelbarer Eindruck*) and perceive the size of their movement (*die Größe der Bewegung*). In his physiological psychology Lotze adopted the theory of feeling of movement ("*Bewegungsgefühl*") and muscle-feeling ("*Muskelgefühl*") by G. A. Spiess.[72]

[71] Lotze, *Medicinische Psychologie*, 334–6.

[72] Gustav Adolph Spiess (1802–1875) was a German doctor, studied medicine at the University of Heidelberg with Friedrich Tiedemann. After obtaining his doctorate he moved to Berlin where he met Wilhelm Baum, a German surgeon. Between 1825 and 1826 he visited, together with Baum, the universities of Paris, London, Edinburgh and other English universities. From April 1826 he worked as a doctor in Frankfurt am Main. His

In the specific case of the visual perception, the psychological component consists in the continuous movements of the optical muscle and the related feeling of movement which introduces the spatial order as part of the intensive elements. As for touch, the psychological component is always the sensory circle. Weber had noticed that the various sensory circles, through their reciprocal overlapping, give rise to the sensation of extension. As William R. Woodward explained:

> In his general formulation for the perception of visual and cutaneous surfaces, Lotze postulated a system of nervous excitations, *a* and *b*, accompanied by sensations. These are joined by a new nervous event *c* and a new sensation signalling their location in relation to one another. His definition of the local sign *c* assumed an interactionist theory of mind. Bodily movements release mental changes, whereas mental laws characterize mind.[73]

The ability to organize elements in spatial series is an innate capacity of the mind and the organized elements (the local signs) are empirical. In this sense Lotze took a median position

---

main work is *Pathologische Physiologie. Grundzüge der allgemeinen Krankheitslehre*, 3 vols. (Frankfurt: Meidinger, 1857). This work gave rise to a controversy with Rudolf Ludwig Karl Virchow and gave Spiess the opportunity to demonstrate his deep medical and philosophical background. He was co-founder and director of the medical and microscopic "Senckenberg Natural Research Society" in Frankfurt. Spiess's theory states that the qualitative differences in the feeling of movement have their seat not in an original muscular feeling, but in skin sensations. On the contrary, the perception of the order of magnitude of a muscle movement must be sought in the immediate self-consciousness of the muscle; see: G. A. Spiess, *Physiologie des Nervensystems: vom ärztlichen Standpunkte dargestellt* (Braunschweig: Vieweg, 1844), 76ff; R. H. Lotze, *Medicinische Psychologie*, §§ 26 and 31.

[73] W. R. Woodward, *Hermann Lotze. An Intellectual Biography* (Cambridge: Cambridge University Press, 2015), 210.

(*Mittelstellung*) between empiricism ('learn to see') and nativism[74], because there is an innate mental capacity that applies to empirical elements.[75] This innate capacity of the mind organizes local signs into spatial series within a two-dimensional visual field; depth is empirically acquired through touch. In the words of Lotze:

> Die Ausbildung der Raumanschauungen führt uns auf diesen Vorgang zurück; denn sie sind nicht allein die beständige Voraussetzung jedes Unterschiedes zwischen uns und einer uns fremden Welt, sondern schon ihre eigene Vollendung zu der Totalauffassung eines nach drei Richtungen ausgedehnten Weltraums ist das Product einer eben solchen Deutung der Sinnesempfindungen und ihrer Beziehungen unter einander. Nur die flächenförmige Anordnung der Punkte im Sehfeld ist eine Raumanschauung, die wir ohne Zuthun unsere Vorstellungsverlaufs der Einrichtung unserer Organisation und dem physisch-psychischen Mechanismus verdanken; die Tiefe des Raumes erkennt auch der Gesichtssinn nur mittelbar nach Anleitung der Erfahrungen, während dem Tastsinn alle Dimensionen des Weltraums gleichmässig nur durch eine Verkettung seiner einzelnen Empfindungen entstehen.[76]

By way of summary, we can say that, understood as the sensation of the external localization of the stimulus in addition to the sensation of movement caused by the changes

[74] According to Lotze, starting from simple intensive sensory qualities it is not possible to construct a spatial representation, it is the mind that orders the sum of qualities in a spatial sense. Empiricism affirms that spatial representation is empirically acquired through the senses, nativism affirms that it is innate. Nativism has many forms: Kant affirmed that space was part of the transcendental structure of subjectivity, while Hering affirmed—naturalizing Kantian philosophy—that spatial perception was innate in the physiological structure of the nervous system (see the note on Hering, 59 n). In fact, Lotze overcame both empiricism and nativism because the representation of space was neither innate nor empirically acquired but consisted of specific mental acts (innate) that ordered empirically acquired data.

[75] See: C. Stumpf, *Über den psychologischen Ursprung der Raumvorstellung* (Leipzig: S. Hirzel, 1873), 73.

[76] Lotze, *Medicinische Psychologie*, 417–8.

of state occurring within muscles and nerves, the local sign is the point of connection allowing for the transformation of the space that we perceive into the space that we think, that is, into an idea. In this sense, we can speak of an interdisciplinary theory of spatial perception that connects together physiology, psychology and the philosophy of mind. Taken together, all these activities—the external stimulus affecting the body, muscles' and nerves's reaction, the sensory formation of the feeling of movement and then its re-elaboration by thought—allow us to reconstruct the provenance of objects and external events in our consciousness.

It is worth remembering that, according to Lotze, there is not a one-to-one correspondence between the external physical stimulus and sensation. In other words, we cannot say that the activity of the mind corresponds exactly to external reality. On this point, Lotze followed the results of the E. H. Weber's experiments on sensation. According to Lotze, mind freely produces representations on the basis of sensation; similarly, sensibility spontaneously produces sensations or feelings on the basis of external stimuli. Here the occasionalist theory appears again as having been of fundamental importance to Lotze's thought.

This understanding separated Lotze from Kant's perspective. Lotze did not consider space as an a priori form of intuition, and, therefore, as subjective. It results from our re-elaboration of an objective stimulus which comes from the outside world and hence has an empirical root. Space is no longer a priori and innate, although it has its specific genesis.

A further divergence from Kant's thought was Lotze's conception of human sensations as a spontaneous product of the mind which does not correspond to nor resemble the outside world. The life of the mind, even at its lowest levels, is freely productive. In this sense, Lotze wrote that our perceptions and the outside world share the same relation as the wooden key of a piano and the sound that it provokes.[77] Hermann von Helmholtz also expressed the idea that

[77] See: *ibid.*, 177.

sense organs produce not a corresponding image of the external world but only 'signs' that we mentally re-elaborate and then transform into ideas or representations valid for us. Similar idea had been further developed by the Southwest Neo-Kantian Heinrich Rickert and later by the logical empiricist Moritz Schlick.[78]

In his 'grater' *Logik* (1874), Lotze distinguished the formal significance from the real significance of thought. In its formality, thought is nothing more than a tool that we use in order to create order among our representations; consequently, it has no direct contact with external reality. According to the theory of the formal significance of thought, logical forms and the laws of their application are the presuppositions whereby thought constitutes its nexus of representations in the particular form that thought itself deems true. At the same time, thought also has a real significance, an objective validity that it realizes; the aim of thought is not to reflect external reality but to reach the mentioned realization. This objective validity, which Lotze called both product and final thought, is realized through the use of laws and logical acts, which remain both formal, instrumental and psychological. Thus, in its formal significance, thought has no direct contact with reality but in its real significance it coincides with reality. In other words, the theory of the real significance of thought is based on a basic confidence (*Zuversicht*) in the coincidence between the movements of thought and the course of things. The movement of thought that connects two representations is a psychic process; as Lotze explained it:

> this movement is merely a psychical process, without which indeed our result could neither be obtained in the first instance nor repeated afterwards in memory, but which has nevertheless to be abstracted from the

[78] See: N. Milkov, "Concept Formation in Science: Heinrich Rickert and the Logical Empiricists", (unpublished manuscript), 2020, Microsoft Word file.

> real significance of the act of thought to which it ministered, as a scaffolding (*Lehrgerüst*) is withdrawn when the building is completed. Thus we see at once in an example of the simplest possible kind the antithesis between the merely formal significance of an act of thought and the real significance of its product.[79]

He continued thus:

> In the same way every one who desires to enjoy the prospect from a hilltop has to traverse some particular straight or winding path from the point at which he starts up to the summit which discloses the view; this path itself is not part of the view which he wishes to obtain. The Thought itself on the other hand in which the process of thinking issues, the prospect obtained, has *Objective* validity (*objective Geltung*); the various paths followed by various travellers once traversed and left behind, the scene which opens before them is the same to all alike, an object independent of the subjectivity of the individual; it is not merely one more affection of his consciousness which he experiences, but an object presented to his thought which also presents itself as the same self-identical object to the consciousness of others.[80]

Ultimately, Lotze's radical opposition to the reduction of mental to physical events led him to argue that certain crucial aspects of human mental life, such as knowledge, will, and emotion, cannot be explained in strictly physical-physiological terms. The general aim of Lotze's philosophy was thus to overcome any partial vision of man and nature, whether it be mechanistic and materialistic reductionism or idealistic anti-reductionism. The major achievement of Lotze's *Medicinische Psychologie* lies less in the presented results of empirical research on some specific mental processes, and more in its deep reflections on the interrelation between physiology, psychology and philosophy.

---

[79] R. H. Lotze, *Logik* (Leipzig: Hirzel, 1874), 540; english trans., *Logic, in Three books: of Thought, of Investigation, and of Knowledge*, B. Bosanquet (ed. and trans.), (Oxford: Clarendon Press, 1884), 475–6.

[80] R. H. Lotze, *op. cit.*, 557; engl. trans., 492.

4.6. The impact of Lotze's theory of local signs

4.6.1. Hermann von Helmholtz

Lotze's theory of local signs was of great importance to Hermann von Helmholtz. Among other things, he claimed that sensations are "symbols" or "signs" that allow us to acknowledge the "quality" of objects and, therefore, the objects themselves.[81] First, we should immediately remark that Helmholtz's 'empirical' theory of visual perception was based on the recognition of a psychic activity that he called "unconscious inference".[82] This psychic activity, essentially associative, is the core of the perceptual process. According to Helmholtz, this process is empirical and, in his view, empiricism is entirely consistent with the recognition of the existence of a psychic activity preceding experience.[83]

[81] H. von Helmholtz, *Handbuch der Physiologischen Optik* (1856–1867), (Hamburg-Leipzig: Voss, 1909–1911), 2nd vol., 5–6.

[82] Helmholtz developed his empiricist theory of vision in his Kant-Lecture "*Kant-Rede*" ("Über das Sehen des Menschen") held in Königsberg on February 27, 1855. See: H. von Helmholtz, *Vorträge und Reden* (Braunschweig: Vieweg, 1896), 1st vol., 87–117.

[83] It is generally accepted that Helmholtz's idea according to which spatial perception cannot be simply reduced to the empirical and physiological level and the consequent assumption of a psychological activity synthesizing the various nervous inputs and organizing them into spatial patterns comes from Lotze's *Medicinische Psychologie*. See: T. Lenoir, "The Eye as Mathematician. Clinical Practice, Instrumentation, and Helmholtz's Construction of an Empiricist Theory of Vision", in D. Cahan (ed.), *Hermann von Helmholtz and the Foundations of Nineteenth-Century Science* (Berkeley-Los Angeles-London: University of California Press, 1993), 109–53; R. Steven Turner, "Consensus and Controversy. Helmholtz on the Visual Perception of Space", in D. Cahan (ed.), *op. cit.*, 154–204.

As for the problem of sensations, Helmholtz agreed with Lotze's theory of local signs. Our sensations do not resemble the external world, that is, the external objects that stimulate our nervous system. Sensations are only signs or symbols that we "learn" to read.[84] The sensations are not directly connected to the external object but to the nervous system.

By adopting Lotze's theory of local signs, Helmholtz overcame Johannes Müller's physiological innatism. Müller held that the representation of space has no empirical genesis, but it is closely related to the anatomical and physiological structures of the nervous system. Hering also stated something similar, rejecting any psychical activity in the process of perception.[85] Spatial perception is "innate" in the anatomical structure of our nervous system. Significantly, such pre-constituted anatomical structures and innate physiological behaviors were not confirmed by experimental investigation. This brought Helmholtz to empiricism in psychology.

The nervous system is not able by itself to organize its qualitative and intensive elements into spatial representations. To this end, it is necessary to postulate the existence of a psychical activity able to "read" the various "signs" or nerve inputs and to compose a spatial representation on the basis of associations. The mind accomplishes these associations on the basis of repeated experiences and memory.[86]

Lotze showed that the spatial intuition (*die räumliche Anschauung*) is a thematic core connecting anatomical and physiological research with psychology. Empirical research in spatial perception (*Raumvorstellung*) confirmed that certain purely psychological phenomena

[84] See: H. von Helmholtz, *Handbuch der Physiologischen Optik* (1856–1867), (Hamburg-Leipzig: Voss, 1909–1911), 3rd vol., 433.

[85] See above the Helmholtz-Hering's controversy (59 n).

[86] H. von Helmholtz, *Handbuch der Physiologischen Optik* (1856–1867), (Hamburg-Leipzig: Voss, 1909–1911), 3rd vol., 433–34.

could not be explained on a purely physiological basis. It was necessary to postulate a mind that could explained what physiology by itself could not: the transformation of purely qualitative and intensive sensations into spatial representations.

4.6.2. Wilhelm Wundt

The relationship between physiology and psychology is central in the thought of Wilhelm Wundt who was Helmholtz's assistant in Heidelberg and was interested in Lotze's theory of local signs since 1862.[87] Wundt granted Lotze the merit (*Verdienst*) of having paid due attention to the psychological side of sensorial perception (*Sinneswahrnehmung*). However, on the other hand, he maintained that Lotze did not adequately explain the spatial order in which 'local signs' are situated but only considered this spatial order as an original and a priori property of the human mind.

Wundt returned to the Lotze's theory of local signs in his "Zur Theorie der räumlichen Gesichtswahrnehmungen" (1898).[88] He once again acknowledged Lotze's merit in having clearly grasped the 'psychological' meaning of the reconstruction of spatiality (*Wiedererzeugung der Räumlichkeit*) but criticized the fact that he did not give the question an adequate solution. Lotze had merely postulated the existence of the mind as an organizing activity. Moreover, according to Wundt, Lotze developed the theory of local signs in order to answer an essentially metaphysical question: can the mind, in an immediate way and without

[87] See: W. M. Wundt, *Beiträge zur Theorie der Sinneswahrnehmung* (Leipzig und Heidelberg: C. F. Winter'sche Verlagshandlung, 1862), 12–13.

[88] W. M. Wundt, "Zur Theorie der räumlichen Gesichtswahrnehmungen", in *Philosophische Studien* (Leipzig: Engelmann, 1883–1903), 14th vol., 1–118.

the help of other organs, perceive the extension through retinal images? Or, should we think of a means by which the mind can transform intensive into the extensive elements?

According to Lotze, through the system of local signs the mind transforms purely intensive sensations into spatial representations. According to Wundt, however, this approach would not solve the problem of the spatial perception (*Raumvorstellung*). Lotze's local signs are just "physiological nervous processes".[89] As such, they can only produce intensive sensations. The mind attributes an extensive, measurable spatial value to these intensive sensations—it has such an innate capacity. Unfortunately, this original ability of the mind to attribute extension to what is by definition purely intensive—such as a set of tones—does not solve the problem of spatial perception (*Raumvorstellung*). On the contrary, according to Wundt, it actually raises a new problem.

In short, Wundt's criticism of Lotze can be reduced to the following question: how is it possible that, alongside possessing a certain intensity and quality that distinguishes them from each other, physiological nervous processes, such as local signs, are also located in a specific space which provides them with a third property: spatiality?[90]

In summary, this is why, according to Wundt, Lotze grasped the centrality of the mind by space perceiving (*Raumvorstellung*) only indirectly: because he realized that physiology alone cannot explain the genesis of the spatial order. In consequence, it must postulate the existence of an organizing capacity providing spatial order to physiological complexes. Lotze certainly understood the centrality of psychological analysis in the processes of perception. Unfortunately, he failed to directly address the problem of mind. According to Wundt, the

[89] R. H. Lotze, *Medicinische Psychologie*, 331.

[90] See: W. M. Wundt, *Zur Theorie der räumlichen Gesichtswahrnehmungen*, 99–100.

only way to do this is to observe its internal functioning by means of an experimental method.

Wundt clearly acknowledges the existence of a psychic sphere whose internal functioning had been described by Weber-Fechner's law which had an eminently theoretical value. Wundt applied to psychology the experimental method of physical science, stating that it is possible to *directly* measure the stimulus that produces the sensation (response of the mind). The psychic effect is *indirectly* measured on the basis of the direct measurement of the physical cause. Wundt's experiments were aimed at demonstrating that the psyche is endowed with regularity so that it might be possible to formulate the law of its behavior with the help of Weber-Fechner's law. Most importantly, by means of this lawful regularity, the experimenter can *indirectly* measure the activity of the mind. Wundt's experimental psychology is based on a philosophical vision called psycho-physical parallelism whose main character is the interaction between mind and body. Whereas Lotze considered the interaction as based on a fundamental incomparability between mind and body (precisely for this reason his psychology is dualistic and he developed his peculiar occasionalist vision of this relationship), Wundt interpreted it in a monistic sense. He rejected the conception of the incomparability in favour of a possible comparison of mind and body. Without such a hypothesis, no measurement, albeit indirect, would be possible.

4.6.3. William James

Lotze's theory of local signs was also important to William James, who in the chapter 20 of his *The Principles of Psychology* dealt with the perception of space. The analysis of the theory of local signs is a key topic of this chapter.[91]

According to James, sensation has two parameters. It has a specific *qualia* that radically differs in different sensations; and it has its specific location.[92] James raised the question that Lotze had already posed in the *Medicinische Psychologie*, namely, the question of the relationship between quality and locality, or position of sensation. Undoubtedly, the locality or the position has a spatial character that the *qualia* of the sensation cannot have. James said:

> *Can these differences of mere quality in feeling, varying according to locality yet having each sensibly and intrinsically and by itself nothing to do with position, constitute the 'susceptibilities' we mentioned, the conditions of being perceived in position, of the localities to which they belong?*[93]

And he continued:

> Lotze, who in his *Medizinische Psychologie* first described the sensations in this way, designating them, thus conceived, as *local-signs*. This term has obtained wide currency in Germany, and *in speaking of the* 'LOCAL-SIGN THEORY' *hereafter, I shall always mean the theory which denies that there can be in a sensation any element of actual locality, of inherent spatial order*, any tone as it were which cries to us immediately and without further ado, 'I am *here*', or 'I am *there*'. If, as may well be the case, we by this

[91] See: W. James, *The Principles of Psychology* (New York: Henry Holt and Co, 1890); repr. New York: Dover Publications, 1950, II, 155–66.

[92] According to James, the sensations have their specific *qualia* that differs from a *qualia* of another sensation and they (the sensations) are felt *where* they belong.

[93] James, *op. cit.*, II, 157.

> time find ourselves tempted to accept the Local-sign theory in a general way, we have to clear up several farther matters. […] *The sign is a quality of feeling and the thing is a position*.[94]

James suggested a reasonable interpretation of Lotze's theory. According to Lotze, additional sensations (*Nebenempfindungen*) are signs or hints that, in themselves, are not spatial; these signs are occasions which the mind orders spatially. Space is extrinsic and supplementary to sensation. As conclusion, Lotze postulated the existence of an innate mind activity which orders the various sensations in spatial series. James opposed the mentalism of *Medicinische Psychologie* and stated that the extension is given directly in the sensation itself.[95] James replaced Lotze's atomistic and punctual sensation with a stimulated sensation, in which the extension of the stimulus was given directly without the need for mind's mediation.[96]

James rejected Lotze's mentalism already in the *Preface* because

> all attempts to explain our phenomenally given thoughts as products of deeper-lying entities (whether the latter be named 'Soul', 'Transcendental Ego', 'Ideas', or 'Elementary Units of Consciousness') are metaphysical. This book consequently rejects both the associationist and the spiritualist theories; and in this strictly positivistic point of view consists the only feature of it for which I feel tempted to claim originality.[97]

The limits of this positivist and anti-metaphysical statement became clear in the course of the *Principles*. Consciousness could not be understood as an association of discrete and atomistic entities—as considered by the German psychological-scientific tradition (Müller, Helmholtz,

---

[94] *Ibid.*, 157–58.

[95] See: James, *op. cit.*, I, 349 n. Here Lotze is defined by James as "a strong defender of the Soul-Substance theory" in his *Medicinische Psychologie*; cf., James, *op. cit.*, II, 275–6.

[96] See: Woodward, *op. cit.*, 225.

[97] James, *op. cit.*, vi.

and Wundt)—but as a continuous change, a ‘stream’ in which transition and continuity have more value than substantive and punctual states. In this sense, Lotze’s criticism of associationism played a fundamental role in James’ psychology.

5. H. Lotze and W. James: dependence and originality

William James was a passionate reader of Rudolph Hermann Lotze's works, in particular, of *Medicinische Psychologie* and *Mikrokosmos*.[1] The accurate reading of these books is evident in *The Principles of Psychology* in which he mentioned Lotze already in the "Preface". Otto F. Kraushaar highlighted Lotze's "influence" on William James; Paul Grimley Kuntz even spoke of a "dependence".[2]

The fundamental idea that James drew from Lotze's works is that psychology should take into account not only the scientific-experimental investigation of the psyche but should also make philosophical inquiry in this area, both metaphysical and epistemological. The search for truth in psychology is the synthesis between observational facts (*Thatsachen des Augenscheins*) and the principle of criticism or judgment (*Principien der Beurtheilung*), of reflective observation (*reflectirende Beobachtung*). These philosophical principles, fundamental for the search of truth, are human views on the world, including moral and religious views. James stated that:

> That theory will be most generally believed which, besides offering us objects able to account satisfactorily for our sensible experience, also offers those which are most interesting, those which appeal most urgently to our aesthetic, emotional, and active needs.[3]

[1] James bought a copy of the *Medicinische Psychologie* in 1867 in Germany and there is a great number of notes in his copy that prove an accurate and detailed reading of the book. (See: W. Woodward, *op. cit.*, 224) James also admired Lotze's *Metaphysic*.

[2] O. F. Kraushaar, (1936, 1938, 1939, 1940); P. G. Kuntz, (1971).

[3] James, *op. cit.*, II, 312.

The cooperation of philosophical and scientific interests aimed at producing a satisfactory psychological theory is undoubtedly an idea that James drew from Lotze.

According to both, psychology must postulate a dualism of mind and body. The interaction between mind and body cannot become a subject-matter of an exact science; it must rather be understood as a correlation between mind and brain. According to James, the task of psychology was to confirm this correlation. On the contrary, Lotze postulated the existence of a Soul-Substance unifying all mental states. Such a mentalistic claim was rejected by James, who only collected, described and correlated mental states. Unlike James, Lotze understood mental states as effects of deep causes composing the mind.

Finally, in *Essays in Radical Empiricism* James replaced the mind/body dualism of the *Principles* with the concept of "pure experience" in which the subject/object dualism eventually disappears.

5.1. The limits of the scientific psychology

In the "Preface" to the *Principles* James discriminated psychology as a natural science from metaphysical psychology. As a natural science, psychology must uncritically accept certain data as basis for its research: it is science that studies thoughts and feelings. The task of psychology is to ascertain "the empirical correlation of the various sorts of thought or feeling with definite conditions of the brain, can go no farther—can go no farther, that is, as a natural science. If she goes farther she becomes metaphysical".[4] Psychology becomes metaphysical when it *explains* thoughts or feelings on the basis of deep causes such as mind or the elementary units of consciousness. For this reason, James opposed the associationist and the mentalist theories.

[4] James, *op. cit.*, I, vi.

In the second half of the nineteenth century, Francis Bowen, leading figure of the American academic psychology (he had been professor at Harvard University), still investigated the faculty of the mind. This was the context against which James' empiricist and anti-metaphysical approach stood out as definitely new.

During his stay in Germany in 1868 (James visited his colleagues in Dresden, Berlin, and Heidelberg) James came into contact with the scientific psychology of Johannes Petrus Müller's school: Helmholtz and Wundt. As a result of this formative experience in Germany, in 1875 James founded one of the first experimental laboratories of psychology at Harvard University. Wundt opened his own laboratory in Leipzig a few years later, in 1879. G. Stanley Hall, James' former student, opened his own laboratory at the Johns Hopkins University in 1881.

While writing his work, however, James became progressively more critical towards the attempt to consider psychology as a natural science. James' anti-metaphysical attitude did not lead him to a total endorsement of the conceptions of scientific psychology.[5] As James wrote:

> The spiritualist and the associationist must both be 'cerebralists', to the extent at least of admitting that certain peculiarities in the way of working of their own favorite principles are explicable only by the fact that the brain laws are a codeterminant of the result. Our first conclusion, then, is that a certain amount of brain-physiology must be presupposed or included in Psychology. […] Mental states occasion also changes in the calibre of blood-vessels, or alteration in the heart-beats, or processes more subtle still, in glands and viscera. If these are taken into account, as well as acts which follow at some remote period because the

[5] It is important to highlight that James' interest was wide-ranging. Alongside the chapters that demonstrated an accurate knowledge of the most recent studies of cerebral physiology, there were chapters of clear metaphysical relevance (e.g. chapter VI, *The Mind-Stuff Theory*).

> mental state was once there, it will be safe to lay down the general law that no mental modification ever occurs which is not accompanied or followed by a bodily change.[6]

According to James, 'cerebralism' means that there is a correlation between physical and mental states, but such a correlation is not to be understood as the strict mechanism of Weber's law. To remind the reader, Weber's law claims that there is a logarithmic relation between body and mind. At that time, the most important work of the scientific psychology was undoubtedly Wundt's *Grundzüge der physiologischen Psychologie* (1874). In this work, the law of Weber-Fechner was adopted as the fundamental law of psychology.

James also rejected Fechner's interpretation of Weber's law. According to Fechner, "the just-perceptible increment is the sensation-unit" and, consequently, all our sensations would be masses of sensation-units. The associationist theory that considered sensations as "masses of units combined" was defined by James as "fragile" and "absurd". James declared himself against the associationism as an attempt to turn psychology into an exact science.[7]

Human mental states, human behavior could not be considered as simple logarithmic increments of a physical stimulus, because this would disregard a fundamental factor, that is, the human ability to act according to ends. It is a matter of fact that in his *Principles* James explored the metaphysical theme of the mechanism-teleology relationship and free will.[8] This gives reason to say that the anti-metaphysical way declared in the "Preface" was not consequentially followed. Lotze, whose name appears since the "Preface", became a leading authority of the book for James.

---

[6] James, *op. cit.*, I, 4–5.

[7] See: *ibid.*, I, 545–9.

[8] See: *ibid.*, I, 6–11.

James' critique of scientific psychology went even further, holding that these psychologists "give one nowhere a central point of view, or a deductive or generative principle. They distinguish and refine and specify *in infinitum* without ever getting on to another logical level".[9] They study consciousness by dividing it into smaller and smaller parts, which are, then, combined together in accordance with the laws of association. In this way, the unitary point of view on consciousness is not taken into account. They give more importance to the atomic facts than to the connecting element.

5.2. James' critique of associationism

Ralph Barton Perry, James' pupil, stated that:

> James's early and persistent rejection of associationism, in what he called its 'nihilistic' implications, certainly owed something to Lotze, who had distinguished merely external conjunctions from the 'inward kinship' of things that 'belong' together.[10]

James explicitly dealt with associationism in the chapter 6 of *The Mind-Stuff Theory*, an "exclusively metaphysical" chapter.[11] According to the associationist theory, human mind is

[9] James, *op. cit.*, II, 448.

[10] R. B. Perry, *The Thought and Character of William James* (Little, Brown, 1935), I, 586–7. In 1936 Perry won the Pulitzer Prize for biography and autobiography with such a biographical book dedicated to his master James.

[11] James, *op. cit.*, I, 145.

constituted by a multiplicity of distinct ideas associated in a unit.[12] According to James this is "logically unintelligible" because:

[12] Herbart developed an associationist psychology. To specify better such a theory, we must deal with the problem of metaphysics. According to Herbart, there is a radical distinction between the real essences, metaphysically understood, and the way in which these essences are perceived and known by the subject. On this point Herbart followed the Kantian distinction between noumenon and phenomenon. The real essences are simple and have no relation with other essences; relations are only the accidental point of view of the knowing subject on reality. The relations between things that we perceive and know are only psychological representations which refer to things but do not exhaust their essence. According to Herbart, from the metaphysical point of view, relation has no value and the whole knowledge building is made of judgments, which are associations of ideas or representations.

Herbart's psychological associationism was sharply criticized by Lotze. He argued that reality, metaphysically speaking, is relation. In *Mikrokosmos* (III, IX) Lotze wrote about things' interrelation (*der Zusammenhang der Dinge*) and rejected the concept of position (*Position*, *Setzung*) of being. The ontological form of substances is a relation, because the whole substance consists of single elements that Lotze named atoms. Lotze's metaphysical building is then represented by three fundamental concepts: atoms, substances and relations. The substances constructed by atoms and relations are states of affairs (*Sachverhalt*). According to Lotze, these latter are expressed in logical forms by judgments. Judgments (logical forms) connect ideas in the same way as substances (ontological forms) are interrelated in reality; this is possible because judgment is no longer, as Herbart said, a simple association of ideas or representations; judgment connects things or contents. This means that the logical and epistemological forms of judgments are secondary and depend on those ontological forms that are primary and independent. On the basis of this general assumption we can state that "the content of a judgment manifests, in Lotze's view, the structure of the minimal ontological interrelation that obtains among objects (things)" (N. Milkov, "Hermann Lotze and Franz Brentano", in *Philosophical Readings. Online Journal of Philosophy*, M. Sgarbi and D. De Santis (ed.), 10 vol., 2, 2018, 117.).

Furthermore, Lotze argued for the primacy of judgement on the concept and for a variation of the context-principle. In this connection Lotze criticized Plato precisely because he claimed a primariness of the idea with respect to judgment. Lotze wrote that: "On the other hand it must undoubtedly be admitted to be a deficiency in

> All the 'combinations' which we actually know are EFFECTS, wrought by the units said to be 'combined', UPON SOME ENTITY OTHER THAN THEMSELVES. Without this feature of a medium or vehicle, the notion of combination has no sense. […] In other words, no possible number of entities (call them as you like, whether forces, material particles, or mental elements) can sum *themselves* together. Each remains, in the sum, what it always was; and the sum itself exists only *for a bystander* who happens to overlook the units and to apprehend the sum as such; or else it exists in the shape of some other *effect* on an entity external to the sum itself.[13]

According to James, human mind is not composed of smaller units—as claimed by Fechner's psychophysics (Fechner is quoted by James as the defender of the Mind-Stuff theory)—because mind connects the units in a sum or a whole; in other words, mind is an entity external to the elements that it connects and, therefore, the constitutive elements of the

---

the Platonic doctrine that this, which was its actual undertaking, it only half accomplishes. An account of the necessary connexion of two contents of thought must always assume the logical form of a judgment; it cannot be expressed in the form of a mere notion which does not in itself contain a proposition at all. Thus we have always employed laws, that is to say propositions, which express a relation between different elements, as examples to explain the meaning of Validity in contradistinction to Existence. The term cannot be transferred to single concepts without some degree of obscurity: we can only say of concepts that they *mean* something, and they mean something because certain propositions are valid *of* them, as for example the proposition that the content of any given concept is identical with itself and stands in unchangeable relations of affinity or contrast to others." (R. H. Lotze, *Logic: In Three Books, of Thought, of Investigation, and of Knowledge*, B. Bosanquet (trans.), (Oxford: Clarendon Press, 1884), 447–8). This conception of Lotze was consequentially adopted by Brentano. See: N. Milkov, "Lotze's Concept of 'States of Affairs' and its Critics," *Prima Philosophia*, 15, 2002, 437–50; N. Milkov, "Hermann Lotze and Franz Brentano", in *Philosophical Readings. Online Journal of Philosophy*, M. Sgarbi and D. De Santis (ed.), 10 vol., 2, 2018.

[13] James, *op. cit.*, I, 158–59.

mind are the transition and connection of the elements themselves. James' criticism against associationism can be already found in Lotze's *Medicinische Psychologie*. James clearly stated that "Lotze has set forth the truth of this law more clearly and copiously than any other writer."[14]

Lotze rejected a one-to-one correspondence between body and mind and developed his own psycho-physical mechanism as an original alternative to psychophysics. His conception of the relationship between mind and body was not logarithmic. Bodily movements were conceived as occasions that activate the free production of human mind. The mind is different in type from the body and their relationship can only be interpreted in an occasionalistic way.[15]

James' critique of associationism relied, as we have seen, on Lotze's critique. Once consciousness is broken down into atomic parts, then it is no longer possible to weld them together by means of the laws of association.[16] Scientific psychology is consequently not able to comprehend the psychological reality such as it is perceived by the human being:

> The traditional psychology talks like one who should say a river consists of nothing but pailsful, spoonsful, quartpotsful, barrelsful, and other moulded forms of water. Even were the pails and the pots all actually

[14] James, *ibidem*.

[15] The example of the lemonade is helpful to understand this difference. Physical lemonade is a sum of units which, as a sum, remain what they always were: lemon and sugar. When we drink lemonade things are completely different. The taste of lemonade is not a sum of the two different tastes of lemon and sugar but is a completely new taste that cannot be reduced to the simple sum of the two tastes. Cfr. James, *op. cit.*, 158 n.

[16] See: *ibid.*, I, 350–60.

> standing in the stream, still between them the free water would continue to flow. It is just this free water of consciousness that psychologists resolutely overlook.[17]

This stream of thought is the psychological reality that man directly perceives; it represents the primary data of consciousness. The conclusion can be made that the critique of associationism that James drew from the Lotze's *Medicinische Psychologie* helped him by developing the notion of stream of thought.[18]

5.3. Lotze's influence on James' theory of emotions

Lotze also influenced James' study of emotions. Otto F. Kraushaar maintained that:

> In spite of the absence of acknowledgment on the part of James, the striking similarity of the two doctrines, plus the herein established fact of James' knowledge of Lotze's exposition, leads irresistibly to the conclusion that Lotze was one of the great formative influences in James' theory of the emotions. James' position is, in fact, simply a restatement of the Lotzean one, but more clear, incisive and radical; where in Lotze's view the organic responses are still for the most part only contributory to the emotion, for James they become actually constitutive of it. Also, James supports his position with evidence from introspection and pathology of which Lotze had been quite innocent.[19]

There are many similarities between Lotze's and James' theory of emotions. Indeed, both thinkers considered emotions as developing in accordance with a cause-and-effect pattern;

[17] *Ibid.*, 255.

[18] See: Lotze, *Medicinische Psychologie*, 210ff; *Mikrokosmos*, book II, chapter I, § 5; *Metaphysik*, §§ 242, 260.

[19] O. F. Kraushaar, "Lotze's Influence on the Psychology of William James", in *Psychological Review*, XLIII, 1936, 250.

there is no special brain-centre for emotions[20]—the reason is that the latter develop from the peripheral nervous activity; both the authors shared the idea that our body is a "sounding-board" for mental states.

Lotze held that there is a physiological mechanism for the development of emotions and that the organ and functions produce emotions. The kind of body's movement, the number of anatomical elements involved, the movement of joints and muscles: all this directly affects the intensity of the emotion. This led Lotze to reject the existence of a central and separated organ for mental manifestations of emotions. At this issue, Lotze wrote:

> Wir glauben die nächste und wichtigste Begründung der geistigen Functionen nicht sowohl in den *centralen*, als vielmehr in den *peripherischen Organen* und ihren *Functionen* suchen zu müssen.[21]

According to Lotze's *Medicinische Psychologie*, bodily changes—such as the oscillations of the central organs—are the "effects" of a mental stream of ideas, a mental cognition which is their "cause". As Lotze wrote:

> Und so mögen allerdings, wie wir früher bereits andeuteten, schwache Mitoscillationen der Centralorgane den psychischen Vorstellungslauf überall begleiten, doch nicht als seine Ursachen, sondern als seine Folgen, als eine Art von Resonanz, welche die Thätigkeit der Seele zur Verstärkung der Lebhaftigkeit ihrer Vorstellungen secundär in den materiellen Substraten hervorruft.[22]

[20] A century later, in his *Philosophical Investigations* (Oxford: Blackwell, 1953), Wittgenstein produced similar argument. There is no special center of language or of calculi in the brain.

[21] Lotze, *Medicinische Psychologie*, 554; see: *ibid.*, pp. 257ff.

[22] Lotze, *ibid.*, 474.

Mental states (cause) generate body movements (effect), because the body function as the sounding-board of the mind.

James embraced this view of Lotze in his somatic theory of emotions. He presented it in 1884 in an article published in *Mind* (old series). The following year (1885), also the Danish physiologist Carl Georg Lange developed, independently from his American colleague, a somatic theory of emotions.[23] James claimed that the cause of emotion is not something mental, such as grief or rage, but a somatic and physiological phenomenon—tears, heart-beat, blood pressure, breathing, etc. But he immediately added that his somatic theory of emotions was not materialistic, because

> our emotions must always be inwardly what they are, whatever be the physiological ground of their apparition. If they are deep, pure, worthy, spiritual facts on any conceivable theory of they physiological source, they remain no less deep, pure, spiritual and worthy of regard on this present sensational theory. […] If such a theory is true, then each emotion is the resultant of a sum of elements, and each element is caused by a physiological process of a sort already well known. The elements are all organic changes, and each of them is the reflex effect of the exciting objects.[24]

James' somatic theory of emotions holds that the perception of exciting facts can produce bodily changes as its effect. These bodily changes are the "general causes" of emotions.[25]

---

[23] James stated that: "Prof. C. Lange, of Copenhagen, in the pamphlet from which I have already quoted, published in 1885 a physiological theory of their [of emotion] constitution and conditioning, which I had already broached the previous year in an article in Mind." (James, *op. cit.*, II, 449).

[24] *Ibid.*, 453.

[25] *Ibid*., 449.

James further wrote that "the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur IS the emotion."[26]

This view contrasts the common-sense theory of emotion which assumes that the perception of the exciting facts (mental states) causes in us the corresponding emotion (mental state) and the latter causes in us the physical change (physiological plane). James opposed this conception, stating that:

> Common-sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colorless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we should not actually feel afraid or angry.[27]

According to the understanding of common-sense, the emotion is the second step of the sequence, whereas the physical change is the third. This means that emotion is theoretically a mental state separated from the physiological plane that it causes. In contrast, according to James, the separation between emotion and bodily changes is "inconceivable". A purely disembodied emotion is a "nonentity". Emotion is bodily and cannot be relegated to a purely "intellectual realm".[28] James further claimed that:

---

[26] *Ibidem.*

[27] *Ibid.*, 449–50.

[28] *Ibid.*, 452.

> I now proceed to urge the vital point of my whole theory, which is this: If we fancy some strong emotion, and then try to abstract from our consciousness of it all the feelings of its bodily symptoms, we find we have nothing left behind, no 'mind-stuff' out of which the emotion can be constituted, and that a cold and neutral state of intellectual perception is all that remains.[29]

The somatic theory of emotions proposes a different sequence giving rise to emotions. The perception of the exciting fact causes an instinctive reaction of the body, which, next, causes the emotion. In other words, this instinctive reaction consists of reflex movements that generate a certain feeling in us. This feeling is the emotion. According to James, there is a coexistence between bodily perturbation and subjective feeling. As James put it:

> To begin with, no reader of the last two chapters will be inclined to doubt the fact that objects do excite bodily changes by a preorganized mechanism, or the farther fact that the changes are so indefinitely numerous and subtle that the entire organism may be called a sounding-board, which every change of consciousness, however slight, may make reverberate.[30]

Another similarity to Lotze's perspective consists in rejecting the existence of a special brain-centre for emotions. The physiological basis of emotions simply consists of incoming nerve currents, muscles and skin; nothing more needs to be postulated. James wrote:

> An object falls on a sense-organ, affects a cortical part, and is perceived; or else the latter, excited inwardly, gives rise to an idea of the same object. Quick as a flash, the reflex currents pass down through their preordained channels, alter the condition of muscle, skin, and viscus; and these alterations, perceived, like

[29] *Ibid.*, 451.

[30] *Ibid.*, 450.

> the original object, in as many portions of the cortex, combine with it in consciousness and transform it from an object-simply-apprehended into an object-emotionally-felt. No new principles have to be invoked, nothing postulated beyond the ordinary reflex circuits, and the local centres admitted in one shape or another by all to exist.[31]

5.4. The Will: the feeling of innervation and the ideomotor action in Lotze and James

As said above, the psychophysical law of stimulus-reaction reduced human behavior to a mere logarithmic increase. This certainly simplified the work of analysis in the laboratory but did not account for the purposiveness (intentionality) of consciousness because it linked body and mind mechanically.

According to James, there is a correlation between mind and body—in fact, cerebralism states that mental modifications are accompanied or followed by bodily changes—that must be interpreted in a voluntaristic and not in a mechanical way.

James dedicated an entire chapter of *The Principles* to the functions of the brain, considered as an organ of the mind. In it he attested his wide-ranging knowledge of physiological studies in this topic: Broca, Ferrier, Wernicke, Wundt, Luciani, Buccola.[32] These physiological analyse was useful to James as a foundation for his evolutionary approach which in 1907 led him to define his *functional psychology*.[33] Although James criticized Herbert Spencer's definition of mind as correspondence of the real and consequently rejected the conception of the mind as a simple effect of the external environment on the nervous system, he eventually adopted Spencer's idea that the essence of

[31] *Ibid.*, 473–74.

[32] See: James, *op. cit.*, I, ch. II.

[33] See: James, "The Energies of Men", in *Philosophical Review*, XIV, 1907, 1–20. Functionalism dates back to an essay by Dewey *The Reflex Arc Concept in Psychology* (1897) and was then thematized by James in 1907.

mental and bodily life is "the adjustment of inner to outer relations".[34] Mind inhabits the environment; this latter acts on the mind and the mind on the environment. James concluded that:

> On the whole, few recent formulas have done more real service of a rough sort in psychology than the Spencerian one that the essence of mental life and of bodily life are one, namely, "the adjustment of inner to outer relations." Such a formula is vagueness incarnate; but because it takes into account the fact that minds inhabit environments which on them and on which they in turn react; because, in short, it takes mind in the midst of all its concrete relations, it is immensely more fertile then the old-fashioned 'rational psychology,' which treated the soul as a detached existent, sufficient unto itself, and assumed to consider only its nature and properties.[35]

The body or, taken more exact, the nervous system is placed in an environment with which it shares a mutual action which is not only mechanical but also teleological.[36] Mechanical actions are different from mental or intelligent actions, because the latter are able to pursue an *end* and to find the most adequate *means* to achieve it.[37] As iron filings are directed towards the magnet, so instincts and reflex acts are certainly mechanical actions

---

[34] Cf. James, "Remarks on Spencer's 'Definition of Mind as Correspondence'", in *Journal of Speculative Philosophy*, XII, 1878, 1–18. According to James, defining mind as a correspondence of the real, understood as external environment, does not account for a fundamental dimension of human existence: free action in pursuit of ends according to subjective inclinations. According to James, the mind is not a mirror that passively reflects what happens in front of it, but an active intelligence that consciously wants and tries to achieve goals through a process that may be successful or fail.

[35] James, *op. cit.*, I, 6.

[36] See: James, "Are we Automata?", in *Mind* (old series), IV, 1879, 1–22.

[37] See: James, *Principles*, I, ch. I. James' conception of the end is similar to the Aristotelian concept of "causa finalis".

tending to a certain end, that is, self-preservation. However, when the environment creates a new situation in which we cannot achieve a particular end with the usual means, the consciousness chooses other means to achieve it. This was defined by James as intelligent action. According to James,

> The mental life seems to intervene between impressions made from without upon the body, and reactions of the body upon the outer world again. […] The pursuance of future ends and the choice of means for their attainment are thus the mark and criterion of the presence of mentality in a phenomenon. We all use this test to discriminate between an intelligent and a mechanical performance. […] Just so we form our decision upon the deepest of all philosophic problems: Is the Kosmos an expression of intelligence rational in its inward nature, or a brute external fact pure and simple? If we find ourselves, in contemplating it, unable to banish the impression that it is a realm of final purposes, that it exists for the sake of something, we place intelligence at the heart of it and have a religion. If, on the contrary, in surveying its irremediable flux, we can think of the present only as so much mere mechanical sprouting from the past, occurring with no reference to the future, we are atheists and materialists. […] No actions but such as are done for an end, and show a choice of means, can be called indubitable expressions of Mind.[38]

'Cerebralist theory' is the way in which James tried to combine naturalistic psychology with philosophical-metaphysical issues such as the mind-body problem and the mechanism-teleology relation.

Consciousness was no longer understood by James as a priori mind devoid of a temporal development, as was considered by mentalism and rational psychology. He considered consciousness in a dynamic way: it is located in time and within the environment which affect its development. The nervous system was no longer understood as a mechanism producing mental states but as a dynamic system that collects the environmental inputs; the

[38] *Ibid.*, 6–11.

latter are interpreted by the mind in accordance with the dichotomy means-ends that produces body's output in form of a reaction to the environment. In this way the dynamic system replaced the mechanical one.

Undoubtedly, James's conception of mind as a kind of dynamics detecting the most adequate means to pursue its ends raised the problem of human freedom. This is also the reason why James did not keep psychology within the limits of naturalism. These theoretical questions can only be tackled by metaphysics. In this respect, James resorted again to Lotze's *Medicinische Psychologie*. The latter had been a strong supporter of the idea that psychology cannot be a science.[39]

In short, according to James, the environment affects our body and mind; the mind, in order to achieve its ends, induces bodily changes. The main role at that is performed by the

[39] See: Lotze, *Medicinische Psychologie*, pp. 65 and 77. According to Lotze, psychology cannot be considered as a natural science, because it is not a constructive form of science. The first element of psychology is the mind-body relation; it is impossible to *explain* the mind on the basis of the body, because they are incomparable and between them there is a fundamental dualism. The science of nature has nothing to do with dualism but with the comparable movements that take place under certain given conditions and this is precisely what makes the science of nature constructive. According to Lotze, things are different for psychology. Based on the occasionalistic theory of mind-body relation, Lotze affirmed that that scientific research was also possible in psychology, if for scientific research we mean the *description* of the empirical *correlation* between physical and mental states and we do not pretend to build the latter on the former. The *explanation* of how and why a physical state is transformed into a mental state—i.e. the true meaning of the mind-body problem—is not a question that can be tackled by psychology. It is a *metaphysical* question. Fechner rejected dualism in psychology and accepted the monistic view according to which all mind-body relations are made by simple elements that grow logarithmically in accordance with the stimulus that generated them. For this reason, Fechner argued for an associationist conception of the mind; it is an association of smaller elements: sensations. Lotze and James clearly rejected this view.

brain; the brain, in fact, is the point of connection between freedom of mind and neurophysiological determinism. The brain is the place of mind's realization. In fact, once it has freely chosen the end to be pursued, this choice becomes 'effective' and enters the mechanical realm. Mind employs the nervous system to effectively achieve its ideal ends. The nervous system works in accordance with the laws of neurophysiology, that is, in a mechanistic way; once the mind has given the nervous system the input to pursue an end, the nervous system proceeds in accordance with its own laws. Finalism and mechanism, free will and necessity are concretely interconnected in James' psychology. The similarity of this thesis of James with that proposed by Lotze in *Allgemeine Physiologie des körperlichen Lebens* is remarkable.[40]

Like Lotze, James advanced a psychology that postulated the dualism of mind and nervous system—central and peripheral. Scientific psychology does not deal with the question of the interaction between mind and nervous system from the point of view of the specific nature of the object; it postulates dualism, because it is more useful from a practical point of view. As Charles Mercier wrote:

> Having thoroughly recognized the fathomless abyss that separates mind from matter, and having so blended the very notion into his very nature that there is no chance of his ever forgetting it of failing to saturate with it all his meditations, the student of psychology has next to appreciate the association between this two orders of phenomena. […] They are associated in a manner so intimate that some of the greatest thinkers consider them different aspects of the same process. […] When the rearrangement of molecules takes place in the higher regions of the brain, a change of consciousness simultaneously occurs. […] The change of

[40] It is nevertheless appropriate to keep them apart. Whereas in Lotze the *purposiveness of nature* has universal significance, James links it to the subjectivity of the single individual able to adapt to the environment. This idea is rooted the pragmatic and individualistic American mentality.

> consciousness never takes place without the change in the brain; the change in the brain never … without the change in consciousness. But *why* the two occur together, or what the link is which connects them, we do not know, and most authorities believe that we never shall and never can know. Having firmly and tenaciously grasped these two notions, of the absolute separateness of mind and matter, and of the invariable concomitance of a mental change with a bodily change, the student will enter on the study of psychology with half his difficulties surmounted.[41]

James further maintained that through concepts such as "concomitance" or "absolute separateness" scientific psychology has not overcome the problem of the mind–body relationship but simply circumvented it. Psychology should rather try to give answer this metaphysical problem. James writes that:

> The fact is that the whole question of interaction and influence between things is a metaphysical question, and cannot be discussed at all by those who are unwilling to go into matters thoroughly.[42]

In order to explain consciousness' "interaction" with and "influence" on the body, James recalled Lotze's conception of the *Doppelsinnigkeit* of the ideal, developed in Lotze's *Medicinische Psychologie*, according to which feelings and ideas are forces able to cause body movement. According to James:

> As in the night all cats are gray, so in the darkness of metaphysical criticism all causes are obscure. But one has no right to pull the pall over the psychic half of the subject only, as the automatists do, and to say that *that* causation is unintelligible, whilst in the same breath one dogmatizes about *material* causation as if

[41] C. A. Mercier, *The Nervous System and the Mind* (London: Macmillan, 1888), 9–11; see also James, *Principles*, I, 135–6.

[42] James, *Principles*, I, 136.

> Hume, Kant, and Lotze had never been born. One cannot thus blow hot and cold. One must be impartially *naif* or impartially critical. If the latter, the reconstruction must be thorough-going or 'metaphysical', and will probably preserve the common-sense view that ideas are forces, in some translated form.[43]

Lotze's conception of mind as a force causing bodily movement strongly influenced James' psychology. This latter thought that consciousness is impulsive by nature.[44] This central doctrine of James' psychology is rooted in the *Medicinische Psychologie*.[45] According to James, the kinaesthetic idea is the characteristic feature of the voluntary acts. When we consciously want to perform an act, we have in our mind an idea consisting of memory-images of the sensible effects of our act.[46]

James rejected the feeling of innervation, which was central in the psychology of Bain, Wundt, Helmholtz and Mach.[47] According to them, in the voluntary act, in addition to memory-images, there is a current of energy running out from the brain and through the muscles. This current of energy produces a feeling of innervation (*Innervationsgefühl*). According to James, the discharge of energy from the brain through the motor nerves transmits movement to the appropriate muscles is an insentient process.[48] It does not produce feeling.

---

[43] James, *ibid.*, I, 137.

[44] See: James, *ibid.*, II, 526.

[45] See: O. F. Kraushaar, "Lotze's Influence on the Psychology of William James", in *Psychological Review*, XLIII, 1936, 250ff.

[46] See: James, *Principles*, II, 492.

[47] See: *ibid.*, 516.

[48] See: *ibid.*, 493.

Whereas Bain, Wundt, Helmholtz and Mach upheld an *efferent* interpretation of the muscular-feeling (*Muskelgefühl*), according to which it is produced by outgoing energies from the brain, James claimed an *afferent* interpretation of the same feeling. James did not conceive this muscular-feeling as 'outgoing' from the brain and then directing towards the muscle, but, on the contrary, as an effect of the muscle contraction that through 'incoming' nerve currents becomes feeling. The idea guiding James' critique of the feeling of innervation as a prerequisite for the voluntary act, alongside the memory-images, was that consciousness is simple; it tends to a minimal level of complication.[49]

Once again, James adopted his afferent interpretation of *Muskelgefühl* from Lotze's *Medicinische Psychologie*. According to James,

> In his admirably acute chapter on the Will this author [Lotze] has most explicitly maintained the position that what we called muscular exertion is an afferent and not an efferent feeling: "We must affirm universally that in the muscular feeling we are not sensible of the *force* on its way to produce an effect, but only of the *sufferance* already produced in our movable organs, the muscles, after the force has, in a manner unobservable by us, exerted upon them its causality". [Lotze, *Medicinische Psychologie*, 311]. How often the battles of psychology have to be fought over again, each time with heavier armies and bigger trains, though not always with such able generals![50]

[49] See: James, *ibid.*, 496.

[50] *Ibid.*, 523 n. Lotze further wrote: "Unmittelbar hat daher das Muskelgefühl wenig Anspruch auf den Namen eines *Kraftsinnes*; er gebührt ihm selbst in der Art noch nicht, dass es die Kraft, statt sie direct zu messen, vielmehr nach der Grösse ihrer nutzbaren Wirkung schätzte. Denn nicht sowohl die Intensität der functionellen Thätigkeit des Muskels scheint das zu sein, was in ihm empfunden wird, sondern vielmehr die Grösse der Störung oder der Ermüdung, die mit der Ausübung derselben verbunden ist, und die weder Gradunterschieden der Innervation, noch dem erzeugten nutzbaren Effecte der Muskelcontraction überall proportional ist." (Lotze, *Medicinische Psychologie*, 311). In short, according to Lotze, the muscular-feeling is produced not by the

The kinaesthetic idea, whose construction has been described above, is sufficient to produce bodily movement. This is "the type of the process of volition" that James called "ideomotor action".[51] This ideomotor process is evident in the *quasi*-automatic acts in which the flux of thought immediately stimulates the bodily movement. Here, too, James quoted Lotze's *Medicinische Psychologie*, in which the latter had provided a definition of the fundamental features of this process of volition.[52] In James' translation,

> We see in writing or piano-playing a great number of very complicated movements following quickly one upon the other, the instigative representations of which remained scarcely a second in consciousness, certainly not long enough to awaken any other volition than the general one of resigning one's self without reserve to the passing over of representation into action. All the acts of our daily life happen in this wise: Our standing up, walking, talking, all this never demands a distinct impulse of the will, but is adequately brought about by the pure flux of thought.[53]

In such elementary cases of volition there is no gap between the idea and the action. Indeed, in our mind there is no other antagonistic representation that might assume the impulsive nature of the original representation. In other words, if there were no other antagonistic ideas simultaneously present in the mind and able to oppose their impulsive power to the others, then all ideas would turn into action.

---

amount of *energy* that running through and moving muscles, but by the amount of *effort* present in the muscle after movement, as its effect.

[51] James, *Principles*, II, 522.

[52] James quoted Lotze, *Medicinische Psychologie*, 293–4.

[53] James, *Principles*, II, 523.

Once again, James quoted *Medicinische Psychologie* to explain what the impulsive nature of our consciousness means.[54] Ideas and feelings are forces that move the body; muscular contractions comply with the ideas. In James' translation,

> The spectator accompanies the throwing of a billiard-ball, or the thrust of the swordsman, with slight movements of his arm; the untaught narrator tells his story with many gesticulations; the reader while absorbed in the perusal of a battle-scene feels a slight tension run through his muscular system, keeping time as it were with the actions he is reading of. These results become the more marked the more we are absorbed in thinking of the movements which suggest them; they grow fainter exactly in proportion as a complex consciousness, under the dominion of a crowd of other representations, withstands the passing over of mental contemplation into outward action.[55]

It is clear that James's theory of the ideo-motor action was directly inspired by Lotze's doctrine of the ideas of movement (*Bewegungsvorstellungen*).

---

[54] James quoted Lotze, *Medicinische Psychologie*, p. 293.

[55] James, *Principles*, II, 525; "Eine andere Gruppe, die *Nachahmungsbewegungen*, sehen wir nicht mehr von Gefühlen, sondern von *Bewegungsvorstellungen* ausgehen, auch sie, ohne dass irgend ein bemerkbarer Entschluss des Willens mitthätig wäre. Mit leisen Bewegungen des Armes begleitet der Zuschauende den Wurf der Kegelkugel oder die Stösse des Fechters, mit ausführlichen Gesticulationen der ungebildete Erzähler seine Geschichte; während der andächtigen Lectüre einer Schlachtbeschreibung fühlen wir leise Anspannungen unser Muskelsystem entsprechend den geschilderten Bewegungsmomenten durchziehen. Alle diese Wirkungen erfolgen um so deutlicher, je unbefangener wir uns in die Anschauung der Bewegungen vertiefen; sie nehmen ab in dem Masse, als ein gebildetes Bewusstsein beständig zugleich von einer Mehrzahl anderer Vorstellungen beherrscht wird, die diesem Uebergange der Anschauung in wirkliche Bewegung widerstehen." (Lotze, *Medicinische Psychologie*, 293).

In short, the point of departure of exploring any process of volition is the intrinsic impulsive nature of consciousness. James agreed with Lotze on this point. Undoubtedly, the ideomotor action is the most elementary case of volitional process in which the idea immediately moves the body without an intermediate deliberation. The process of volition becomes more complicated when in mind there are several antagonistic ideas that might inhibit each other but still have an impulsive nature.

James also agreed with Lotze on the fact that these higher processes of volition involve additional conscious elements such as consent, fiat and imperative.[56] Will, therefore, requires a deliberative process through which one representation, among other possibilities, is chosen over another, but it also requires an element of attention that allows the chosen representation to be maintained in the mind.[57] Both Lotze and James were aware of the drama of the will which selects an idea activating the physical mechanism. They both upheld the freedom of will.

5.5. Interim remark on Lotze's *Logik* and James's pragmatism: the conception of truth

William James's interest was not focused only on Lotze's *Medicinische Psychologie* and *Mikrokosmos*, but also on his *Metaphysik*[58] and "great" *Logik* (1874). Most importantly, this work helped James to further develop his pragmatism. He understood pragmatism as a

[56] See: Lotze, *Mikrokosmos*, I, 289, and James, *Principles*, II, 526ff.

[57] See: Lotze, *Mikrokosmos*, I, 288, and James, *Principles*, II, 584.

[58] On September 8, 1879, William James wrote: "This summer I've read about a half of Lotze's *Metaphysik*. He is the most delectable, certainly, of all German writers—a pure genius.". See: R. B. Perry, *op. cit.*, II, p. 16 and N. Milkov, "Lotze and the Early Cambridge Analytic Philosophy", in *Prima Philosophia*, 13: 133–53, 2000, p. 133.

completely new way of considering the relationship between mind and reality. It maintains that the value of ideas lies in their working process and in their consequences.

According to James, truth should be no longer understood as a system of valid and eternal propositions that mind can copy. The "philosophic criticisms" of Lotze undermined the absoluteness of this system, emphasizing the "incongruence" of forms and laws of our thought with respect to the "things" tackled by thought. In these "things" subjects and predicates are not separated as in our judgments on them.[59]

James' claims were clearly connected with Lotze's *Logik* in which the real and the formal meaning of "logical acts" are neatly distinguished and in which Lotze maintained his anti-psychologist perspective. According to Lotze, skepticism was rooted in the gap between thought and the world of things (*Sachenwelt*). The correspondence theory of truth, in its classical version, held that truth is the correspondence of thought and the things external to thought (*Veritas est adaequatio rei et intellectus*). This way of understanding knowledge allowed for an indefinite renewal of skepticism. Lotze criticized this conception claiming that human knowledge is not directly related to the world of things but to the world of representations (*Vorstellungswelt*). This epistemological position allowed Lotze to refute skepticism but, at the same time, raised the problem of psychologism.

Indeed, the search for truth becomes a process immanent in the thought itself. However, the truth, understood by Lotze as value (*Geltung*), does not coincide with the psychical process (*psychische Vorgang*) through which our thought is realized. It is precisely for this reason that Lotze distinguished an instrumental significance of thought from its valid content. It *produces* (constructs), through its forms and logical laws, objective contents that, once

[59] See: James, "Review of 'Humanism: Philosophical Essays' by Ferdinand C. S. Schiller (1904)", in *The Works of William James. Essays, Comments and Reviews* (Cambridge: Harvard University Press, 1987), 550.

produced, are separated from the merely instrumental conceptual structure. Most importantly, the distinction between formality and reality of thought cannot be overcome at a logical but at a moral level. A divided world would be morally unacceptable.

In summary, the process of thought has an instrumental significance and the proper form of reality of the products of thought is their *objective Geltung*: these products and this process have different "significances" and this difference entails pragmatic implications.

William R. Woodward investigated James's reception of Lotze's *Logik* and, in particular, the sections "Real and Formal Significance of Logical Acts" and "The a priori truth". James embraced Lotze's critique of the correspondence between act and logical content as well as his critique of associationism. Judgement is no longer considered as a mere association of ideas, but as a relation of contents of thought. As Woodward puts it:

> James paraphrased Lotze's critique of correspondence as saying that "the judgment expresses a relation of two contents, not two ideas," and that we justify this relation by specifying the conditions *x* under which *S* is *P*. He also echoed Lotze with his marginal remark "hypothetical form of all knowledge of reality." But he mocked Lotze in this remark inside the back flyleaf: "the 'a priority' of the Anschauung consists in instantaneously seeing that any simple truth which these forms make possible is universally valid."
>
> In 1878 James showed the first results of his recourse to the Kantian tradition. He argued that humans think by choosing the "reason" or "means," *m*, that connects two otherwise dissimilar ideas, *A* and *Z*. Using the example of a dog fetching a sponge, James observed that the association of water-in-boat and sponge was due to mere contiguity. Human reasoning involves the further step of dissociating the capacity for taking up water from this situation and bringing back perhaps a dipper or a mop. By 1890, James had adopted Lotze's argument for replacing the association of ideas with the function of judgments. He defined the "psychologist's fallacy" as the "confusion of his own standpoint with that of the mental fact about which he is making his report." Citing Lotze: "What we experience, what *comes before us*, is a chaos of

> fragmentary impressions interrupting each other; what we *think* is an abstract system of hypothetical data and laws."[60]

In James' *Pragmatism's Conception of Truth* we see how fundamental Lotze's "philosophic criticism" was to him. Truth is no longer considered an eternal property of our ideas; it no longer means agreement between ideas and reality. If true ideas were the copy of reality, the whole process of knowledge would culminate in an "inert static relation". James concluded that:

> When you've got your true idea of anything, there's an end of the matter. You're in possession; you *know*; you have fulfilled your thinking destiny. You are where you ought to be mentally; you have obeyed your categorical imperative; and nothing more need follow on that climax of your rational destiny. Epistemologically you are in stable equilibrium.[61]

Basing on Lotze's conception, James developed a dynamic conception of truth as a process and as provided with a temporal development. Truth is the product of thought: it must be verified experimentally from time to time. As James wrote:

> *True ideas are those that we can assimilate, validate, corroborate and verify. False ideas are those we can not.* […] The truth of an idea is not a stagnant property inherent in it. Truth *happens* to an idea. It *becomes* true, is *made* true by events. Its verity *is* in fact an event, a process: the process namely of its verifying itself, its veri-*fication*. Its validity is the process of its valid-*ation*.[62]

---

[60] Woodward, *op. cit.*, 364–5.

[61] James, "Pragmatism's Conception of Truth", in *Pragmatism: A New Name for Some Old Ways of Thinking* (New York: Longmans, Green and Co., 1907), 200.

[62] *Ibid.*, 201.

Consequently, science is not a system of propositions valid in themselves, but rather a human product that must be empirically verified. Scientific theories can be considered true if, once verified, they produce satisfactory practical consequences for human needs. Only experience can distinguish what is effective and functional—and therefore true—from what is not. The conception of truth is thus based on that of 'usefulness' and vice versa: the concept of truth is understood as the "idea [that] starts the verification-process, useful is the name for its completed function in experience."[63]

According to James, the meaning of ideas lies in their working process and their consequences, such that ideas have an eminently practical value. For this reason, he did not dwell much on the genesis of ideas, on their history; at the core of his conception of truth there was the future usefulness of ideas. The pragmatic philosophical doctrine considered truth not as a rational destiny that man must fulfill once and for all, but as a future of multiple open possibilities of development of human inventiveness. His own philosophy, as James wrote in the dedication of *Pragmatism* to John Stuart Mill, represented an "openness of mind".

[63] *Ibid.*, 204.

6. Conclusions

Lotze's psychology took into account the results of scientific research and adopted the method of the psychophysiological analysis. Moreover, Lotze maintained that the scientific psychology was not able to satisfy the deepest human needs, including the research on the nature of mind. In his opinion, psychology was rather the discipline that can mediate between natural sciences and philosophy. Physiology and biology are fundamental to the development of the scientific psychology. Psychology can never be a constructive science like physics, since it is based on an underlying dualism (mind-body) that does not allow for an analytical comparison between physical and mental states. However, this does not prevent in principle the possibility of scientific research in psychology, if we understand scientific-psychological research as the detection of correlations between mind and body. The fact that the core of Lotze's Psycho-Physical Mechanism is his peculiar occasionalist perspective gives more solidity to this kind of scientific research. Scientific psychology can only record the elements of correlation between the physical and the psychical dimension, but it cannot provide an actual positive theory of the nature of mind. Between mind and body there is not such thing as a one-to-one correspondence, as claimed by Fechner, who had tried in his psychophysics to found mathematically the mental sphere on the physical one—human deepest needs (*Bedürfnisse des Gemütes*) could certainly not be satisfied by such a knowledge. Nevertheless, there is an occasionalistic correlation. Physical states are occasions (*Veranlassungen*) or signs (*Zeichen*) that allow the mind to activate itself and to organize them; this task of the mind—the organizing activity—cannot be expressed mathematically. The task of scientific psychology is precisely to *describe* this correlation, that Lotze called 'Psycho-Physical Mechanism'. Scientific psychology thus has a *descriptive* value and is not a positive theory that *explains* the nature of the mind-body correlation. In harsh opposition to the naturalistic metaphysics of

materialism—which, thanks to the results of natural science research, affirmed the possibility of reducing all mental states to physical states of the brain—Lotze argued that only the philosophical reflection, understood as metaphysical speculation, was able to *explain* the actual nature of this correlation. From a metaphysical point of view there is no dualism between mind and body, because mind is the primordial reality; the body is a secondary property or an appearance of the mind. For this reason, in Lotze's opinion, psychology had to be understood, nourished and based not only on the physiological research but also on a metaphysical investigation: a mentalist metaphysics that rejects the ontological consistency of the matter and considers such a consistency as specific of the mind. This metaphysical-mentalistic *explanation* of the mind-body correlation is not scientifically useful and applicable. The actual scientific research is mostly characterised by the mind-body dualism, based on the type-difference between the two spheres.

In the attempt to mediate between the metaphysical understanding of reality and the scientific conception of the world, Lotze tried to unify what he considered the best aspects of Idealism and those of Realism at his time. He accepted the idealistic conception of the primordial reality as something ideal, mental, and he founded the possibility of a concrete scientific research on this metaphysical conception. According to Lotze, the limits of Hegelian idealism consisted in having considered the ideal (*das Ideal*) as the pure form of the idea (*die Idee selbst*) without reference to any specific content. For this reason, Hegel had considered psychology as the discipline that deals with the development of the pure form of the mind. According to Lotze, in this sense psychology was one-sided (*einseitig*). Psychology must constantly take into account the results of both the physiological and the biological research, because they provide this discipline with its concrete content and the philosophical speculation that organizes the acquired material in a meaningful perspective.

The foundation of Lotze's psychological pattern therefore consists in the scientific research and the critical-philosophical activity. If one of these two principles is removed, the discipline becomes one-sided. Not considering the philosophical activity makes materialist positions possible again. And if there is no longer a constant attention to the results of scientific research, another type of one-sidedness may arise: the pure mind without specific content. Besides the first cornerstone of Lotze's psychological reflection, i.e. the mediation between science and philosophy, there is another element, with which the first one is closely linked: his harsh criticism of materialism.

Lotze's thought is influenced by the development of psychological investigation as well as by the foundations and perspectives of the logical investigation. Lotze's distinction of *Geltung* and *Sein* as two different and irreducible (*in sich selbst beruhenden Grundbegriffe*) forms of reality, his rejection of the correspondence theory of truth, the epistemological immanentism and his distinction between the real and the formal meaning of logical forms have deeply influenced not only William James, as I showed in Appendix I, but also the Neo-Kantian Baden School, Frege, Brentano, Dilthey, Husserl and the young Heidegger.

Although I consider important to show the general influence of Lotze's thinking, in this work I have not considered these authors as I did in "The *Logik* by R. H. Lotze: the Concept of Geltung",[1] because the subject of the present dissertation is rather how Lotze approached the mind-body problem in his *Medicinische Psychologie*.

Nevertheless, I dedicated the last part of my dissertation to the influence of Lotze's psychological investigation on William James, showing that Lotze was an important, albeit not

[1] M. Vagnetti, "The *Logik* by R. H. Lotze: the Concept of *Geltung*", in D. De Santis (ed.) "Lotze's back!", in M. Sgarbi (ed.) *Philosophical Readings. Online Journal of Philosophy*, X, 2, 129–37.

the only, reference point for James' work *The Principles of Psychology*. Besides some evident similarities, it is worth saying that James' work only partially embraced Lotze's thought. For this reason, in the present dissertation I have clearly underlined that between the two authors there are similarities but also clear differences. Whereas Lotze had postulated the existence of a Soul-Substance that unifies all mental states, James rejected this conception—which he considered "spiritualist"—affirming a simple phenomenal continuity of states of mind without claiming a deeper cause. Furthermore, the dualism common to Lotze and James in *Principles* was then denied by James in his *Essays in Radical Empiricism*, in which he postulated the existence of a 'pure experience'.[2] James, in particular, intended to integrate neurophysiological research into psychology, transforming thus psychology into a natural science, but at the same time he wanted to integrate also metaphysical issues such as consciousness, i.e. the 'Stream of Thought', and the problem of the freedom of will.

The important role that Rudolph Hermann Lotze played in the rise and development of one of the most important philosophers of the 20th-century American debate is, therefore, evident and undeniable.

In conclusion, it is important to understand to what extent Lotze may be read seriously philosopher still today. Lotze's harsh criticism of the materialism of his time may be a key element to analyze the contemporary materialism in the philosophy of mind which is rather popular nowadays. In the 1960s a group of Australian philosophers (Ullin Place, John Smart, David Armstrong) presented the type identity theory in the "Australasian Journal of Philosophy". This theory affirmed the absolute identity of mental states with the physical states of the brain in the same way in which we claim that water is identical to H_2O. Type identity was

[2] See: S. Poggi and M. Vagnetti, "James lecteur de Lotze", in F. Boccaccini (ed.) *Lotze et son héritage. Son influence et son impact sur la philosophie du XX siècle*, (Bruxelles: P. I. E. Peter Lang, 2015), 161–9.

considered as the only alternative to dualism. Consciousness was understood as identical to the nervous system.[3]

Undoubtedly, type identity theory is a materialist theory because it states that primordial reality is matter and that, since, according to them, mental states and brain states are identical, it is possible to reduce the mind to the body. This reductionism is both intertheoretic and ontological. The possibility of an intertheoretic reductionism is due to the existence of appropriate bridge laws that make it possible to completely translate psychology into neuroscience.

The Australian materialists were in complete contradiction with Leibniz's principle of the indiscernibility of identicals. If it was true that mental and bodily states are identical, then they should have all their properties in common, but experience tells us rather the opposite. The pain (mental state) that I perceive is sharp but the nerve fibers not. Hilary Putnam's multiple realizability of mental states is the most famous criticism of the new materialism. In his opinion, it is impossible that men, octopuses, inferior organisms or extraterrestrials provided with a silicon nervous system share the same identical physical state, when they feel pain.

Putnam aimed at rejecting any kind of materialism as well as the affirmation of the irreducibility of the mind. The concept on which this critique was based was the idea that between mind and body, that is, between mental state and physical state there is a basic type-difference which does not allow for any reduction of the one to the other. The idea of incom-

[3] Paul Churchland in 1979 in *Scientific Realism and the Plasticity of Mind* (Cambridge: Cambridge University Press, 1979) argued for a similar idea. Neurophysiology could replace the whole mental life precisely as modern chemistry dismissed the phlogiston. Of course, this position represented a radical inter theoretic (psychology could be completely translated into neurophysiology) and ontological reductionism (mind is secondary to the body).

parability was upheld by Lotze in *Medicinische Psychologie* and was the basis of his occasionalistic theory. Although in a completely new context Lotze's type-difference is still a good tool against the current materialistic trend of the philosophy of mind.

7. References and Further Reading

7.1. Primary Sources

7.1.1. James

James, William. (1890). *The Principles of Psychology*, New York: Henry Holt and Co; repr. (1950), New York: Dover Publications.

James, William. (1892). *Psychology: Briefer Course*; repr, (1910), New York: Henry Holt.

James, William. (1897). *The Will to Believe, and Other Essays in Popular Philosophy*; repr. (1956). *The Will to Believe and Other Essays in Popular Philosophy and Human Immortality*, New York: Dover.

James, William. (1902). *The Varieties of Religious Experience: A Study in Human Nature*; repr. (1958), New York: New American Library.

James, William. (1907). *Pragmatism: A New Name for Some Old Ways of Thinking*, repr. (1981), *Pragmatism*, ed. Bruce Kuklick, Indianapolis: Hackett.

James, William. (1909). *A Pluralistic Universe: Hibbert Lectures at Manchester College on the Present Situation in Philosophy*, New York: Longmans, Green & Co.

James, William. (1909). *The Meaning of Truth: A Sequel to "Pragmatism"*; repr. (1970), *The Meaning of Truth*, Ann Arbor: University of Michigan Press.

James, William. (1911). *Memories and Studies*; repr. (1968) Westport: Greenwood Press.

James, William. (1911). *Some Problems of Philosophy: A Beginning of an Introduction to Philosophy*; repr. (1931), ed. Henry James, New York: Longmans, Green.

James, William. (1912). *Essays in Radical Empiricism*, ed. Ralph Barton Perry, New York: Longmans-Green.

James, William. (1975/88). *The Works of William James*, ed. Frederick H. Burkhardt, 19 vols., Cambridge, Massachusetts and London, England: Harvard University Press.

7.1.2. Lotze

Lotze, Rudolph Hermann. (1840) *Gedichte*, Leipzig: Weidmann.

Lotze, Rudolph Hermann. (1841a). *Metaphysik*, Leipzig: Weidmann.

Lotze, Rudolph Hermann. (1841b). "Bemerkungen über den Begriff des Raumes. Sendeschreiben an C. H. Weiße," *Zeitschrift für Philosophie und Spekulative Theologie* 8: 1–24; in *Lotze* 1885/91, i, pp. 86–108.

Lotze, Rudolph Hermann. (1843). *Logik*, Leipzig: Weidmann.

Lotze, Rudolph Hermann. (1845). *Über den Begriff der Schönheit*, Göttingen: Vandenhoeck & Ruprecht.

Lotze, Rudolph Hermann. (1851). *Allgemeine Physiologie des körperlichen Lebens*, Leipzig: Weidmann'sche Buchhandlung.

Lotze, Rudolph Hermann. (1852). *Medicinische Psychologie oder Physiologie der Seele*, Leipzig: Weidmann.

Lotze, Rudolph Hermann. (1856a). *Mikrokosmus: Ideen zur Naturgeschichte und Geschichte der Menschheit, Versuch einer Anthropologie*, 1st vol., Leipzig: Hirzel; new ed. (2017) *Mikrokosmos*, Nikolay Milkov (ed.), 3 vols., Hamburg: Felix Meiner Verlag.

Lotze, Rudolph Hermann. (1856b). "Selbstanzeige des ersten Bandes des Mikrokosmus," *Göttinger gelehrte Anzeigen* 199: 1977–92; in Lotze 1885/91, iii, pp. 303–14.

Lotze, Rudolph Hermann. (1857). *Streitschriften*, Part One, Leipzig: Hirzel.

Lotze, Rudolph Hermann. (1858). *Mikrokosmus*, 2nd vol., Leipzig: Hirzel.

Lotze, Rudolph Hermann. (1864). *Mikrokosmus*, 3rd vol., Leipzig: Hirzel.

Lotze, Rudolph Hermann. (1868). *Geschichte der Aesthetik in Deutschland*, München: Cotta.

Lotze, Rudolph Hermann. (1874). *Logik*, Leipzig: Hirzel.

Lotze, Rudolph Hermann. (1879). *Metaphysik*, Leipzig: Hirzel.

Lotze, Rudolph Hermann. (1885/91). *Kleine Schriften*, ed. by David Peipers, 4 vols., Leipzig: Hirzel.

Lotze, Rudolh Hermann. (2003). *Briefe und Dokumente*, Zusammengestellt, eingeleitet und kommentiert von Reinhardt Pester, Würzburg: Königshausen & Neumann.

English Translation:

Lotze, Rudolph Hermann. (1884). *Outlines of Metaphysic*, trans. and ed. by G. T. Ladd, Boston: Ginn.

Lotze, Rudolph Hermann. (1885). *Microcosmus: An Essay Concerning Man and his Relation to the World*, 2 vols., E. Hamilton and E. E. Constance Jones, Trans., Edinburgh: T. & T. Clark.

Lotze, Rudolph Hermann. (1885a). *Outlines of Aesthetics*, trans. and ed. by G. T. Ladd, Boston: Ginn.

Lotze, Rudolph Hermann. (1885b). *Outlines of Practical Philosophy*, trans. and ed. by G. T. Ladd, Boston: Ginn.

Lotze, Rudolph Hermann. (1885c). *Outlines of Philosophy of Religion*, trans. and ed. by G. T. Ladd, Boston: Ginn.

Lotze, Rudolph Hermann. (1886). *Outlines of Psychology*, trans. and ed. by G. T. Ladd, Boston: Ginn.

Lotze, Rudolph Hermann. (1887). *Outlines of Logic*, trans. and ed. by G. T. Ladd, Boston: Ginn.

Lotze, Rudolph Hermann. (1887). *Logic* (B. Bosanquet et al., trans.), 2nd ed., Oxford: Clarendon Press.

Lotze, Rudolph Hermann. (1888). *Metaphysic* (B. Bosanquet et al., trans.) 2nd ed., Oxford: Clarendon Press.

7.2. Secondary Sources

Apelt, Ernst Friedrich. (1845–1846). *Die Epochen der Geschichte der Menschheit. Eine historisch-philosophische Skizze*, 2 vols., Jena: Verlag von Friedrich Mauke.

Apelt, Ernst Friedrich. (1854). *Die Theorie der Induction*, Leipzig: Engelmann.

Apelt, Ernst Friedrich. (1857). *Metaphysik*, Leipzig: Engelmann; repr., (1910), Halle: Hendel.

von Autenrieth, Johann Heinrich Ferdinand. (1836). *Ansichten über Natur- und Seelenleben*, Stuttgart und Augsburg: Cotta.

Baab, Florian. (2018). *Die kleine Welt. Hermann Lotzes Mikrokosmos: Die Anfänge der Philosophie des Geistes im Kontext des Materialismusstreits*, Hamburg: Felix Meiner Verlag.

Bell, Charles, Shaw A. (November 1868). "Reprint of the "Idea of a New Anatomy of the Brain"". *J Anat Physiol.* 3 (Pt 1): 147–82.

Biran, Marie-François-Pierre Gonthier (Maine). (1986). *Rapports des sciences naturelles avec la psychologie et autres écrits sur la psychologie*, 8th vol. in *OEuvres*. Paris: Librairie philosophique J. Vrin.

Borgard, Thomas. (1999). *Immanentismus und konjunktives Denken. Die Entstehung eines modernen Weltverständnisses aus dem strategischen Einsatz einer ›psychologia prima‹ (1830–1880)*, Tübingen.

Brentano, Franz. (1874). *Psychologie vom empirischen Standpunkt*, Leipzig: Verlag von Duncker & Humblot.

Büchner, Ludwig. (1855). *Kraft und Stoff. Empirisch-naturphilosophische Studien. In allgemein-verständlicher Darstellung*, Frankfurt a. M.: Meidinger.

Cabanis, Pierre Jean Georges. (1802). *Rapports du physique et du moral de l'homme*, Paris: Hector Bossange et Cie.

Cahan, David (ed. by). (1993). *Hermann Von Helmholtz and the Foundations of Nineteenth-Century Science*, Berkeley/Los Angeles/London: University of California Press.

Carnap, Rudolf. (1928). *Der logische Aufbau der Welt*, Berlin-Schlachtensee; new ed., (1998), Hamburg.

Churchland, Paul. (1979). *Scientific Realism and the Plasticity of Mind*, Cambridge: Cambridge University Press.

Darwin, Charles. (1859). *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, London: John Murray.

Descartes, René. (1637). *Discours de la méthode pour bien conduire sa raison et chercher la vérité dans les sciences*, Leiden: Ian Maire.

Dewey, John. (1896). *The Reflex Arc Concept in Psychology*, University of Chicago Press.

Du Bois-Reymond. (1872). *Über die Grenzen des Naturerkennens*, Leipzig: Verlag von Veit & Comp.

Dubislav, Walter. (1933). *Naturphilosophie.* (Philosophische Grundrisse Heft 2), Berlin: Junker & Dünnhaupt.

Fechner, Gustav Theodor. (1851). *Zend-Avesta oder über die Dinge des Himmels und des Jenseits. Vom Standpunkt der Naturbetrachtung*, Leipzig: Leopold Voss.

Fechner, Gustav Theodor. (1860). *Elemente der Psychophysik*, 2 vols., Leipzig: Breitkopf & Härtel.

Flourens, Marie-Jean-Pierre. (1858). *De la vie et de l'intelligence*, Paris: Garnier frères.

Frege, Gottlob. (1969). *Nachgelassene Schriften*, ed. by H. Hermes, F. Kambartel, Hamburg.

Friedmann, Michael. (2001). *Dynamics of Reason. The 1999 Kant Lectures at Stanford University*, Stanford, California: CSLI Publications.

Fries, Jakob Friedrich. (1822). *Die mathematische Naturphilosophie nach philosophischer Methode bearbeitet. Ein Versuch,* Heidelberg: Christian Friedrich Minter.

Fries, Jakob Friedrich. (1828). *Neue oder anthropologische Kritik der Vernunft*, Heidelberg: Christian Friedrich Minter.

Fries, Jakob Friedrich. (1839). "Über den optischen Mittelpunkt im menschlichen Auge", in *Sämtliche Schriften*, 5, 411–91.

Gabriel, Gottfried. (1989a). "Einleitung des Herausgebers. Lotze und die Entstehung der modernen Logik bei Frege", in *H. R. Lotze, Logik, Erstes Buch.* Vom Denken, Hamburg: Meiner, xi–xliii.

Gabriel, Gottfried. (1989b). "Einleitung des Herausgebers: Objektivität, Logik und Erkenntnistheorie bei Lotze und Frege", in *H. R. Lotze, Logik, Drittes Buch*. Vom Erkennen (Methodologie), Hamburg: Meiner, xi–xxxiv.

Haas, Arthur Erich. (1909). *Die Entwicklungsgeschichte des Satzes von der Erhaltung der Kraft*, Vienna: Alfred Hölder.

Hall, Marshall. (1842). *Von den Krankheiten des Nervensystems*, Leipzig: Otto Wigand.

Hegel, Georg Wilhelm Friedrich. (1830). *Enzyklopädie der philosophischen Wissenschaften im Grundrisse*, Heidelberg: Verwaltung des Oswaldschen Verlags, C. F. Winter, 3rd ed.

Heidelberger, Michael. (1993). *Die innere Seite der Natur. Gustav Theodor Fechners wissenschaftlich-philosophische Weltauffassung*, Frankfurt am Main: V. Klostermann.

Helmholtz, Hermann. (1856–1867). *Handbuch der physiologischen Optik*. Leipzig: Leopold Voss.

Helmholtz, Hermann. (1863). *Die Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik*. Braunschweig: Vieweg.

Helmholtz, Hermann. (1882–95). *Wissenschaftliche Abhandlungen von H. Helmholtz*, Leipzig: Johann Ambrosius Barth.

Herbart, Johann Friedrich. (1806–1808). *Sämtliche Werke*, 2nd vol. Aalen: Scientia Verlag, (1964).

Herbart, Johann Friedrich. (1816). *Sämtliche Werke*, 4th vol. Aalen: Scientia Verlag, (1964).

Herbart, Johann Friedrich. (1822). *Sämtliche Werke*, 5th vol. Aalen: Scientia Verlag, (1964).

Herbart, Johann Friedrich. (1824–1825). *Sämtliche Werke*, 6th vol. Aalen: Scientia Verlag, (1964).

Hering, Karl Ewald Konstantin. (1861–1864). *Beiträge zur Physiologie*, Leipzig: Engelmann.

Hering, Karl Ewald Konstantin. (1878). *Zur Lehre vom Lichtsinne*. *Sechs Mittheilungen an die Kaiserl. Akademie der Wissenschaften in Wien*. Zweiter, unveränderter Abdruck, Wien: Gerold.

Kant, Immanuel. (1786). *Metaphysische Anfangsgründe der Naturwissenschaft*, Riga: Johann Friedrich Hartknoch.

Kraushaar, Otto F. (1936). "Lotze's Influence on the Psychology of William James", in: *Psychological Review*, XLIII, 235–57.

Kraushaar, Otto F. (1938–1939). "Lotze as a Factor in the Development of James's Radical Empiricism and Pluralism", in: *Philosophical Review*, XLVII, 517–26; XLVIII, 455–71.

Kraushaar, Otto F. (1938). "What James's Philosophical Orientation Owed to Lotze", in: *Philosophical Review*, XLVII, 517–25.

Kraushaar, Otto F. (1940). "Lotze's Influence on the Pragmatism and Practical Philosophy of William James", in: *Journal of the History of Ideas*, I, 439–58.

Kuhn, Thomas. (1959). "Energy Conservation as an Example of Simultaneous Discovery", in Marshall Clagett, ed., *Critical Problems in the History of Science*, Madison, Wis.: University of Wisconsin Press, 321–56; reprinted in Kuhn's (1977) *The Essential Tension: Selected Studies in Scientific Tradition and Change*, Chicago and London: University of Chicago Press.

Kuntz, P. G. (1971). “Rudolph Hermann Lotze, Philosopher and Critic”, Introduction to: *Santayana* 1889, pp. 3–94.

Lange, Friedrich Albert. (1866). *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart*, Iserlohn: Verlag von J. Baedeker.

Leibniz, Gottfried Wilhelm. (1954). *Principes de la Nature et de la Grace fondés en Raison, Principes de la Philosophie ou Monadologie*, Paris: Presses Universitaires de France.

Lenoir, Timothy. (1982). *The Strategy of Life: Teleology and Mechanics in Nineteenth-Century German Biology*, Dordrecht and Boston: D. Reidel.

Liebig, Justus. (1851). *Chemische Briefe*, 3rd ed., Heidelberg: C. F. Winter.

Martinelli, Riccardo. (1999). *Misurare l’anima. Filosofia e psicofisica da Kant a Carnap*, Macerata: Quodlibet.

Mercier, Charles Arthur. (1888). *The Nervous System and the Mind*, London: Macmillan.

Meynert, Theodor Hermann. (1871). “Vom Gehirn der Säugetiere”. In: Salomon Stricker: *Handbuch der Lehre von den Geweben des Menschen und der Tiere*, Leipzig: Verlag von Wilhelm Engelmann.

Milkov, Nikolay. (2000). “Lotze and the Early Cambridge Analytic Philosophy”, in *Prima Philosophia*, 13: 133–53.

Milkov, Nikolay. (2012). “Karl Popper’s Debt to Leonard Nelson”, in *Grazer Philosophische Studien* 86, 137–56.

Milkov, Nikolay and Peckhaus, Volker (eds.). (2013). *The Berlin Group and the Philosophy of Logical Empiricism*, Dordrecht: Springer.

Milkov, Nikolay. “Rudolph Hermann Lotze (1817–1881)”, *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/lotze/.

Milkov, Nikolay. (2020). “Concept Formation in Science: Heinrich Rickert and the Logical Empiricists”, (unpublished manuscript), Microsoft Word file.

Moleschott, Jakob. (1852). *Der Kreislauf des Lebens*, Mainz: Verlag von Victor von Zabern.

Müller, Johannes. (1826). *Zur vergleichenden Physiologie des Gesichtssinnes des Menschen und der Thiere*, Leipzig: Snobloch.

Müller, Johannes. (1834). *Handbuch der Physiologie des Menschen*. Coblenz: Verlag von J. Hölscher.

Nagel, Thomas. (1965). "Physicalism", in *Philosophical Review* 74, (July):339–56.

Parrini, Paolo. (1998). *Knowledge and Reality. An Essay in Positive Philosophy*, Dordrecht: Kluwer Academic Press.

Parrini, Paolo. (2002). *Sapere e interpretare. Per una filosofia e un'oggettività senza fondamenti*, Milan: Guerini e Associati.

Perry, Ralph Barton. (1935). *The Thought and Character of William James*, 2 vols., Little, Brown.

Pester, Reinhardt. (1997). *Hermann Lotze. Wege seines Denkens und Forschens*, Würzburg: Königshausen & Neumann.

Pester, Reinhardt. (2003). "Unterwegs von Göttingen nach Berlin: Hermann Lotzes Psychologie im Spannungsfeld von Psychologie und Philosophie", in L. Sprung and W. Schönpflug (eds.), *Zur Geschichte der Psychologie in Berlin*, 2nd ed., Frankfurt: Peter Lang, pp. 125–51.

Poggi, Stefano. (1977). *I sistemi dell'esperienza. Psicologia, logica e teoria della scienza da Kant a Wundt*, Bologna: Società editrice il Mulino.

Putnam, Hilary. (1967). "The Nature of Mental States", in W.H. Capitan & D.D. Merrill (eds.), *Art, Mind, and Religion*, Pittsburgh University Press.

Ravenscroft, Ian. (2005). *Philosophy of Mind. A Beginner's Guide*, Oxford: Oxford University Press.

Reichenbach, Hans. (1931). *Ziele und Wege der heutigen Naturphilosophie*, Leipzig: Felix Meiner. New edition: Reichenbach, H. (2011). *Ziele und Wege der heutigen Naturphilosophie,* (N. Milkov ed.), Hamburg: Felix Meiner Verlag.

Rolando, Luigi. (1809). *Saggio sopra la struttura del cervello dell'uomo e degli animali e sopra le funzioni del sistema nervoso*, Sassari: nella stamperia da S.S.R.M privilegiata.

Santayana, George. (1889). *Lotze's System of Philosophy*, P. G. Kuntz (ed.), Bloomington: Indiana University Press, 1971.

Schelling, Friedrich Wilhelm Joseph. (1804). *System der gesammten Philosophie und der Naturphilosophie insbesondere*, Würzburger Vorlesungen, Nachlass.

Schneider, Steven. "Identity Theory", *Internet Encyclopedia of Philosophy*, https://www.iep.utm.edu/identity/#H3.

Smart, John Jamieson Carswell. (1959). "Sensations and Brain Processes", in *Philosophical Review*, 68, 141–56.

Spiess, Gustav Adolph. (1844). *Physiologie des Nervensystems: vom ärztlichen Standpunkte dargestellt*, Braunschweig: Vieweg.

Stumpf, Carl. (1873). *Über den psychologischen Ursprung der Raumvorstellung*, Leipzig: Verlag von S. Hirzel.

Taylor, Charles. (1967). "Mind-body identity, a side issue?", in *Philosophical Review* 76, (April):201–13.

Treviranus, Gottfried Reinhold. (1831–33). *Die Erscheinungen und Gesetze des organischen Lebens*, Bremen: Heyse, 2 vols.

Vogt, August Christoph Carl. (1855). *Köhlerglaube und Wissenschaft. Eine Streitschrift gegen den Hofrat Rudolph Wagner in Göttingen*, Gießen: Ricker'sche Buchhandlung.

Volkmann, Alfred Wilhelm. (1836). *Neue Beiträge zur Physiologie des Gesichtssinnes*, Leipzig: Breitkopf und Härtel.

Wagner, Rudolph. (1842–1853). *Handwörterbuch der Physiologie mit Rücksicht auf physiologische Pathologie*, 4 vols., Braunschweig: Vieweg.

Weber, Ernst Heinrich. (1851). *Die Lehre vom Tastsinne und Gemeingefühle auf Versuche gegründet*. Braunschweig: Vieweg.

Weiße, Ch. H. (1835). *Grundzüge der Metaphysik*, Hamburg: Friedrich Perthes.

Wittgenstein, Ludwig. (1953). *Philosophical Investigations*, G.E.M. Anscombe and Rush Rhees (ed.), Oxford: Blackwell.

Woodward, William Ray. (2015). *Hermann Lotze. An Intellectual Biography*, Cambridge: Cambridge University Press.

Wright, Chauncey. (1873). "Evolution of the Self-Consciousness", in: Wright, Chauncey, 1877, *Philosophical Discussions*, New York: Burt Franklin, reprinted 1971.

Wundt, Wilhelm. (1862). *Beiträge zur Theorie der Sinneswahrnehmung*, Leipzig und Heidelberg: C. F. Winter'sche Verlagshandlung.

Wundt, Wilhelm. (1874). *Grundzüge der physiologischen Psychologie*, Leipzig: Verlag von Wilhelm Engelmann.

Wundt, Wilhelm. (1883–1903). "Zur Theorie der räumlichen Gesichtswahrnehmungen", in *Philosophische Studien*, Leipzig: Engelmann, 14th vol., 1–118.

7.3. Further Reading

Adair-Toteff, Christopher. (1994). "The Neo-Kantian Raum Controversy", in: *The British Journal for the History of Philosophy*, II, 131–48.

Bauch, Bruno. (1918). "Lotzes Logik und ihre Bedeutung im deutschen Idealismus", in: *Beiträge zur Philosophie des deutschen Idealismus* 1: 45–58.

Bayertz, Kurtz. Gerhard, Myriam. Jaeschke, Walter. (ed. by). (2012). *Der Materialismus-Streit*, Hamburg: Meiner.

Bayertz, Kurtz. Gerhard, Myriam. Jaeschke, Walter. (ed. by). (2012). *Der Ignorabimus-Streit*, Hamburg: Meiner.

Beiser, Frederick C. (2013). *Late German Idealism. Trendelenburg and Lotze.* Oxford: Oxford University Press.

Beiser, Frederick C. (2014). *After Hegel. German Philosophy 1840–1900*, Princeton: Princeton University Press.

Besoli Stefano. (1992). *Il valore della verità. Studio sulla «logica della validità» nel pensiero di Lotze.* Florence: Ponte alle Grazie.

Boccaccini, Federico (ed. by). (2015). *Lotze et son héritage. Son influence et son impact sur la philosophie du XX siècle*, Bruxelles: P.I.E. PETER LANG.

Centi Beatrice. (1993). *L'armonia impossibile. Alle origini del concetto di valore: metafisica, logica e scienze della natura in R. H. Lotze dal 1838 al 1843*, Milano: Guerini.

Damböck, Christian. (2017). *Deutscher Empirismus. Studien zur Philosophie im deutschsprachigen Raum 1830-1930*, Switzerland: Springer International Publishing.

De Palma, Armando and Pareti, Germana. (2004). *Mente e corpo: dai dilemmi della filosofia alle ipotesi della neuroscienza*, Torino: Bollati Boringhieri.

De Palma, Armando and Pareti, Germana. (2014). *Vita: la fisiologia in Germania tra materialismo e vitalismo (1848-1935)*, Pisa: Edizioni ETS.

De Palma, Armando and Pareti, Germana. (2017). *Vitalismo o meccanicismo? I fenomeni della vita e la fisiologia europea del secolo XIX*, Pisa: Edizioni ETS.

De Santis, Daniele (ed. by). (2018). "Lotze's back!", in: Sgarbi, Marco (ed. by) *Philosophical Readings. Online Journal of Philosophy*, X, 2.

Franzese, Sergio. (2000). *L'uomo indeterminato: saggio su William James*, Roma: D'Anselmi.

Gosztonyi, Alexander. (1976). *Der Raum. Geschichte seiner Probleme in Philosophie und Wissenschaften*, 2 vols., München and Freiburg: Verlag Karl Alber.

Hartmann, Eduard von. (1888). *Lotze's Philosophie*, Leipzig: Friedrich.

Hatfield, Gary. (1990). *The Natural and the Normative. Theories of Spatial Perception from Kant to Helmholtz*, Cambridge, Massachusetts and London, England: The MIT Press.

Hauser, Kai. (2003). "Lotze and Husserl", *Archiv für die Geschichte der Philosophie* 85: 152–78.

Helm, Georg. (1898). *Die Energetik nach ihrer geschichtlichen Entwickelung*, Leipzig: Verlag von Veit & Comp.

Henry, Jones. (1895). *A Critical Account of the Philosophy of Lotze: The Doctrine of Thought*, Glasgow: MacLehose.

Marty, Anton. (1916). "Anzeige von William James' Werk: "The Principles of Psychology"", in: *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, III, 297–333; repr. in: *Gesammelte Schriften*, I, 1, 105–56, Halle: Niemeyer.

Milkov, Nikolay. (2001). "The History of Russell's Concepts 'Sense-data' and 'Knowledge by Acquaintance'", *Archiv für Begriffsgeschichte* 43: 221–31.

Milkov, Nikolay. (2002). "Lotze's Concept of 'States of Affairs' and its Critics", *Prima philosophia* 15: 437–50.

Milkov, Nikolay. (2008). "Russell's Debt to Lotze", *Studies in History and Philosophy of Science*, Part A, 39: 186–93.

Misch, Georg. (1912). "Einleitung", in: *Hermann Rudolf Lotze, Logik*, hg. von G. Misch, Leipzig: Felix Meiner, pp. ix–cxxii.

Natorp, Paul. (1902). *Platos Ideenlehre*, Leipzig: Dürr.

Orth, E. W. (1986). “R. H. Lotze: Das Ganze unseres Welt- und Selbstverständnisses”, in: Josef Speck (ed.), *Grundprobleme der großen Philosophen.* Philosophie der Neuzeit IV, Göttingen: Vandenhoeck & Ruprecht, pp. 9–51.

Pettoello, Renato. (1986). *Idealismo e Realismo. La formazione filosofica di J. F. Herbart*, Florence: La Nuova Italia.

Poggi, Stefano. (1980). *Le origini della psicologia scientifica*, Torino: Loescher.

Poggi, Stefano. (2000). *Il genio e l’unità della natura. La scienza della Germania romantica (1790–1830)*, Bologna: Società editrice il Mulino.

Poggi, Stefano (ed. by). (2002). *Le leggi del pensiero tra logica, ontologia e psicologia. Il dibattito austro-tedesco (1830–1930)*, Milano: Edizioni Unicopli.

Putnam, Hilary. (1990). *Realism with a Human Face*, Cambridge, Mass.: Harvard University Press.

Robins, Edwin Proctor. (1900). *Some Problems of Lotze’s Theory of Knowledge*, New York: Macmillan.

Thomas, E. E. (1921). *Lotze’s Theory of Reality*, London: Longmans Green.

Valentine, C. W. (1911). *The Philosophy of Lotze in its Theological Aspects*, Glasgow: Robert Maclehose.

Weiße, C. H. (1865). “Rezension von Mikrokosmus by H. Lotze”, *Zeitschrift für Philosophie und philosophische Kritik* 47: 272–315.

Wentscher, Max. (1924). *Fechner und Lotze*, München: Reinhardt.