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## FECHNER'S PANPSYCHISM: A SCIENTIFIC SOLUTION TO THE MIND-BODY PROBLEM\*

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Does Nature or the world have a soul? In other words, does that which is comprehensible, visible, palpable to the senses belong to the total system of that external world which rolls to and fro, turns green and blooms, bears the creatures and their history? Is this totality a single being which appears only to itself, a being which can just as little be recognized by telescopes, earthdrills, yardsticks, chemical reagents and all the mathematics in the world as the corresponding being in us can be viewed with microscopes, scalpels, chemical analyses, and mathematics?<sup>2</sup>

### I. THE PROBLEM

What did Gustav Theodor Fechner (1801-1887) mean by the word "Seele"? In a sense, the topic of this paper is 'soul'. However, I believe that the late Edwin G. Boring was only partially correct when he implied that Fechner was summoning a spiritual belief in panpsychism.<sup>3</sup> The fact that Fechner used soul (*Seele*) interchangeably with mind or spirit (*Geist*) suggests that spirituo-theological distinctions were not so important to him. His panpsychism, the doctrine that the universe is "besouled" (*beseelt*), rests upon a principle akin to interrelation (*Zusammenhang*) and not upon a separable soul. Characteristically he portrayed mind or soul loosely through analogies, after the fashion of Aristotle. My aim is to establish that Fechner's panpsychism was a thorough-going monism and that it served to elaborate the functional relations underlying the later psychophysics.

I have limited my paper by taking into consideration only the pre-experimental period of the psychophysics. In the sole interest of understanding his speculative books for the sake of their contribution to the history of psychology, I have nevertheless been drawn into the borderlands of theology and botany in studying *Das Büchlein vom Leben nach dem Tode* and *Nanna, oder über das Seelenleben der Pflanzen*. The receptions of his books by a theologian, Christian Hermann Weisse, and a botanist, Matthias J. Schleiden, tell us how controversial and yet how original was the interpretation of "soul" which culminated in *Zend-Avesta, oder über die Dinge des Himmels und des Jenseits*. The debate aroused by these books continued for

\*This article was originally prepared as a Master's thesis at Princeton University in May, 1969. I revised it following editorial review from two parts into the present one.

<sup>1</sup>Mr. Shuen-fu Lin aided me by his discussion of literary terms and in particular, the definition of analogy. Mr. Julian Jaynes helped me to clarify my interpretation of Fechner's analogical style. The issue of relations, which so fortuitously coincided with the definition of analogy, came from conversation with Dr. John J. Sullivan. For astute advice on matters psychophysical, I consulted Dr. Carl E. Sherrick. Professor Frank A. Geldard supplied the incentive to write the thesis by joining Mr. Jaynes on my advisory committee.

<sup>2</sup>G. Th. Fechner. *Über die Seelenfrage. Ein Gang durch die sichtbare Welt, um die unsichtbare zu finden*, 2nd ed. (Hamburg und Leipzig: Voss [Amelang, 1861], 1907), p. 10.

<sup>3</sup>E. G. BORING. *A History of Experimental Psychology*, 2nd ed. (New York: Appleton-Century-Crofts, 1950), Chap. 14, p. 278ff.

over a decade, and I have found *Professor Schleiden und der Mond* and *Über die Seelenfrage* useful in clarifying Fechner's scientific originality in the face of the naive Kantian view as well as the identity views of Oken, Schelling, and Spinoza and the monadology views of Leibnitz and Herbart. Why Fechner's notion of "soul" survived the trenchant criticism of his contemporary, the philosopher Rudolph Hermann Lotze, and the utter neglect his scientist colleagues, is an instructive lesson in the history of science and a case study in the separation of experimental psychology from philosophy.

## II. THE IMPORTANCE OF ANALOGY

Fechner was a man possessed by a simple driving conception. He had to find the law behind Nature's two-facedness. The key for him was the style and method of analogy. By means of bold strokes of analogy, he hoped to discover the relations between the spiritual and material worlds.

Although he used abundant analogies in his earlier fanciful writings, his first explicit discussion of analogy occurs in *Nanna*:

Yet should that which is so analogous in the most general appearances of form, life, and activity be not analogous in the most general of all, for which the signs can only be taken from form, life, and activity? Just remember, we have nothing more than that outer to make conclusions about this inner [world].<sup>4</sup>

Analogy is for Fechner an empirical credo applied to the description of inner life, for want of a better term in modern English. For example, look at the movements of plants and you see evidence of sensation; the analogy is from man and animals to plants. Consider how the effects of our thoughts and deeds live after us, and you have life after death; the analogy might be my memory of other persons to others' memory of me.

I will return in much greater detail to Fechner's use of analogy, and the point of mentioning these examples is only to illustrate his methodology. He explained that we should "pay less attention to the particular analogies than to the totality of the various points of view".<sup>5</sup> In other words, it did not matter whether you were speaking of sensation, immortality, or earth soul. At issue was a principle of conscious life, hence nothing less than a functional description of God in this passage from *Die Tagesansicht gegenüber der Nachtansicht*:

Indeed, if the acceptance of God were to rest merely on that requirement, then it would appear weak enough. Now it is in fact true, first, that the imagining of a sensory being existing independently by itself is difficult for us, if it is at all possible, . . . ; second, that the physical movements on which light and sound depend are subsumed in an analogical way under the general world system, as in us they depend on a partial world system formed by each person himself; and third, that the general physical system offers such relationships of analogy, of interconnection, and of causation to our partial one as to make possible a

<sup>4</sup>G. Th. Fechner. *Nanna, oder Über das Seelenleben der Pflanzen*, 3rd ed. (Hamburg and Leipzig: Voss [1848, 1899] 1903), p. 9.

<sup>5</sup>Walter Lowrie. *Religion of a Scientist* (New York: Pantheon, 1946), p. 217. Translation comes from Fechner, *Zend-Avesta*, II, p. 187. See footnote no. 7.

conclusion from me to the other in regard to spiritual capacity. I have detailed this more in previous writings than in this one.<sup>6</sup>

The case for analogy as a kind of preliminary scientific method is made at some length in the Preface to *Zend-Avesta*:

Analogy stands far behind induction in the natural sciences. In the views of this work, you will find the reverse. This lies in the nature of the subject. It rests upon mind (*Geist*) where you cannot see it. The admissibility of such conclusions meets in general no objection, for you are everywhere affirming the mind of other men and animals . . . and this affirmation rests, apart from practical motives, entirely upon analogy.<sup>7</sup>

I will say more about the use of analogy in the next sections of this paper, in which the functional relations of psychophysics come to light. Suffice it to note here that the proto-scientific justification of analogy is closely tied up in Fechner's thinking with the definition of mind, which he reverts to calling soul in the second volume of the *Elemente der Psychophysik*:

We can term the entire body besouled insofar as all the parts of the body combine in a solidary working-together for an action, maintaining our this-worldly life and holding it together in living activity; then we can explain the body as the seat or the carrier of the soul in the broad sense.<sup>8</sup>

## III. MY APPROACH GROUPS ANALOGIES INTO FUNCTIONAL RELATIONS

I wanted to discover the sources of Fechner's creativity in psychology by examining his early speculative books. While men and ideas played some part in his development, he was essentially alone in his panpsychism and in his analogical thought. Moreover, he wrote as he thought, and his thoughts were not always finished ones. Indeed, he lavished paper and ink like nothing else, unless it be lifting psychophysical weights, in his austere eighty-six year life. His style was esoteric and repetitious; it made use of playful analogies between plants and animals, men and stars. Beneath the fanciful titles and the plethora of analogical argument lay buried a serious concern for the principle of conscious life.

I have said that Fechner employed analogy prior to induction in a fashion which was tied to the definition of mind. By now his monism should be familiar, even if it not clear how it was reconciled with panpsychism. The solution for Fechner was to regard mind or soul not as a transcendent substance but as a functional relation. He affirmed this in the historical addenda to the *Elemente*:

The task presented itself originally not at all under the viewpoint of finding a mental unit of measure; rather it was a viewpoint of searching for a functional

<sup>6</sup>Gustav Theodor Fechner. *Die Tagesansicht gegenüber der Nachtansicht* (Leipzig: Breitkopf and Härtel, 1879), pp. 273-274.

<sup>7</sup>Gustav Theodor Fechner. *Zend-Avesta, oder über die Dinge des Himmels und des Jenseits vom Standpunkte der Naturbetrachtung*, 3rd ed. (Hamburg and Leipzig: Voss [1851, 1901], 1906), p. xxiii. There is no English translation of this work, and the translations are my own unless reference is made to excerpts from Lowrie. See footnote no. 5.

<sup>8</sup>G. Th. Fechner. *Elemente der Psychophysik*, 2 vols. (Leipzig: Breitkopf and Härtel, 1860), II, p. 384. For the translation of the first volume, see footnote 25.

relation (*eine funktionelle Beziehung*) between the physical and the psychical which would accurately express their general interdependent relationship.<sup>9</sup>

Given that he acknowledged his search for such a functional relation in 1860, it seems not unreasonable to view his previous writings as guided by the same search for a principle to relate the psychical to the physical.

Perhaps it is no coincidence that Fechner chose the method of analogy to describe mind. One definition of analogy is "a similarity of relations",<sup>10</sup> and this definition will guide my approach. I intend to group the multifarious analogies into several analogies which convey important functional relations: for example, those of inner and outer psychophysics, the logarithmic scale of sensation, and the fundamental law of causation. Whereas Fechner mixed his analogies, I have tried to separate them in a way which illuminates his working out of the psychophysical idea.

#### IV. THE PART-WHOLE ANALOGY

The part-whole analogy is my term for what Fechner variously described as a functional interconnection of the physical parts of the organism. This analogy permeated his 1848 book *Nanna*, subtitled "on the mental life of plants" and the 1851 book *Zend-Avesta*, subtitled "on matters of the heavens and beyond". The plant mind and the earth mind actually connoted a *Zusammenwirken* or "working together" of the parts. Fechner likened the nervous system of animals to the vascular system of plants; in fact, he went so far as to liken the nervous system to the societal system, the system of conscious and unconscious minds of the earth.

Fechner's inductive analogies need not be confused with the deductive abstractions of the *Naturphilosophen*. While the style of organic speculation is reminiscent of Lorenz Oken, whom he read in his youth, he expressly avoided the metaphorical excesses of this school of "Psycho-physiologists". Fechner quoted Oken thus:

The spiral filaments (*Spiralfäsern*) are to the plant what nerves are to the animal. They can with every right be called 'plant nerves', and I rejoice in taking this right for myself.<sup>11</sup>

Then Fechner judiciously explained that it is not a question of filaments representing the nerves. The spiral filaments or tubules (*Spiralgefässe*) in the plants are comparable by analogy but are by no means identical. To sum up, Fechner admitted the dissimilarity of the parts and wholes in each realm, while he argued for the similarity of the functional relations between the respective parts and wholes.

He also observed plant movements and animal reflexes and concluded that sensation could be inferred in one case as well as the other:

The reactions to a stimulus (*Reizbewegungen*) in the detached parts of plants are only analogous to the reactions to a stimulus which can be observed in severed frog limbs and salamander tails, etc. To an extent, certainly, one could postulate that there is no sensation (*Empfindung*) governing these animal

<sup>9</sup>*Ibid.*, II, p. 559.

<sup>10</sup>Webster's *New International Dictionary of the English Language*, 2nd ed. (Springfield, Mass.: Merriam Co., 1943), p. 94.

<sup>11</sup>*Nanna*, p. 35, quoted from Lorenz Oken, *Naturphilosophie*, II, p. 112.

limbs; then one could turn this against us, stating that reactions to a stimulus can occur entirely without sensation and therefore signify absolutely nothing about a sensation. . . . Distorted comparisons should be avoided. We do not claim in fact that a reaction to a stimulus in itself makes a sensation; rather, that it serves the sensation, or the impulse (*Trieb*) connected to it, in the interconnection (*im Zusammenhange*) of the organism.<sup>12</sup>

Again with sensation, as with nerves, Fechner has based his argument for mind on the relation between the parts and wholes. He made this very clear as follows:

Indeed, reactions to a stimulus do as little imply sensation of these parts in plant limbs as in animal limbs; however, just as certainly do they imply sensation in the whole plant as in the whole animal.<sup>13</sup>

In other words, sensation is an inference based upon the organism as a whole, or else it is nothing at all. One might formulate the analogical proof of mind by saying that sensation : movement :: mind : bodily activity. Sensation and mind are relations of the whole to the parts.

#### V. THE INNER-OUTER ANALOGY

The relation of consciousness to the physical organism was expressed by the part-whole analogy. Similarly, the relation of consciousness to the physical world can be expressed by the inner-outer analogy. This analogy appeared in the 1836 book *Das Büchlein vom Leben nach dem Tode* and again in *Nanna* and in *Zend-Avesta*. Fechner wrote that

man leads both an outward and an inward life in this world; the one visible and perceptible for everyone in his looks, words, and deeds; the other perceptible only for himself in his thoughts and emotions.<sup>14</sup>

The inner thoughts of a man are known by his outer actions, Fechner went on to say. This statement represented more than a truism. In another passage from *Nanna* he swept aside the problem of other minds and asserted that the relation between knower and known was solved by an inference from the physical to the psychical:

My conclusion that you, my friend, have a mind is founded at last upon the fact that your outward appearance, your speech and your behavior are analogous to mine. That is to say, it is founded upon form, construction, color, movement, and sound, all of which are physical signs. What can I see directly of your mind? I merely infer it through all those factors.<sup>15</sup>

<sup>12</sup>*Ibid.*, p. 137-138. Most often he refers to the sensitive plant (*Mimosa pudica*) or to the genus *Brachyotum*. Fechner lists the *Reizbewegungen* of stamens, pistils, leaves, and other parts of the flower at the end of the chapter. He mentions species which exhibit each reaction. The list is useful for its relation to the literature, pp. 138-147.

<sup>13</sup>*Ibid.*, p. 138. This sentence is the omitted portion in the previous quotation.

<sup>14</sup>*Das Büchlein vom Leben nach dem Tode*, trans. by Hugo Wernecke (Chicago and London: Open Court Publishing Co., 1914), p. 8. The first German edition was published under a pseudonym, Dr. Müllers. *Das Büchlein vom Leben nach dem Tode* (Dresden: Ch. F. Grimmsche Buchhandlung, 1836).

<sup>15</sup>*Ibid.*, p. 138. The translation is amended from Lowrie's, since he left a religious aftertaste by saying, "I merely infer it through all those factors, my brother." The final sentence in German is: "Ich lege sie nur in all das

Fechner solved the paradox of solipcism with a single stroke of analogic logic! Empirical analogy was the basis for believing that "minds" exist.

Fechner contended that we could likewise infer a psychical life in plants, animals, the earth, and the stars. He was aware that his view would be misunderstood, and he wrote in *Nanna*:

Commonly people deny that there is a psychic constitution in plants similar in any respect to that of man and the animals. They do not find the physical organization and living activities (*Lebensäußerungen*) of the former analogous enough to those of the latter. Whereas in fact the analogy of the psychical is all that we have when we conclude that there are other psychical lives beyond our own.<sup>16</sup>

The analogy in this case would be plant mind : plant body :: human mind : human body :: animal mind : animal body. The same argument from analogy was extended to the earth in *Zend-Avesta*; thus, mind : body :: earth mind : earth body. Fechner described the body and mind of the earth in this way:

We need not set for ourself the self-contradictory requirement of a sensory (*sinnliche*) presentation where no sensory object is present. The mind of the earth is no animal you can point to in a cage; the cage alone is on exhibit and its arrangement [is ready] for the spiritual animal.<sup>17</sup>

The import of conceiving of mind by analogy to our own was profound. Soul could be described in the language of empirical observation. Fechner's idea was the kernel of a scientifically fruitful mind-body position. He called it the alternating (*wechselnde*) or natural (*natürliche*) view because it took account of both kinds of experience.<sup>18</sup> He explained the alternatives to the physiologist thus:

The man who elects to trace the sequence of bodily expressions (*den Ausdruck im Leiblichen*), this being the standpoint of science, is of course perfectly free to do so; but he must not wish to deny thereby the existence of the mind, which though it expresses itself bodily (*in dem leiblichen Ausdruck*) to others is at the same time aware of itself . . . As a physiologist he perhaps does right in conceiving it thus. But man has still another side than that which he shows to the physiologist, a side which the physiologist must ignore . . .<sup>19</sup>

This passage comes from *Nanna* and it tells us that Fechner was secure in his scientific solution to the mind-body problem by 1848. In *Zend-Avesta* three years later he listed six mind-body positions, three of which were useful scientifically (*wissenschaftlich*) and three more which were "those of life". The alternating view, although it belonged to those of life, "had in particular the significance that it provides the foundation of practical experience (*Erfahrungsgrundlage*) for the others. . . ."<sup>20</sup> Importantly, he was careful to distinguish his empirical position from the "identity view" of the *Naturphilosophen* who fused matter and spirit.<sup>21</sup> Theirs was an identity of first substances, his was an identity of relations.

<sup>16</sup>*Ibid.*, p. 5. Translation revised from Lowrie, p. 166.

<sup>17</sup>*Zend-Avesta*, I, p. 8.

<sup>18</sup>*Ibid.*, I, p. 161.

<sup>19</sup>Lowrie, p. 195, quoted from *Nanna*, p. 79.

<sup>20</sup>*Zend-Avesta*, I, p. 161.

<sup>21</sup>*Ibid.*, I, p. 161.

## VI. THE ASLEEP-AWAKE ANALOGY

Two kinds of analogy have so far been introduced: the part-whole analogy established the mind as the interconnection of the organism, whereas the inner-outer analogy revealed mind as one of two sides of experience. I would introduce next the asleep-awake analogy. This analogy expressed the hierarchy (*Stufenbau*) of consciousness, or the relation of higher to lower levels of consciousness. In *Das Leben nach dem Tode*, for instance, Fechner stated that we live in successive levels of asleep, asleep and awake, and awake. The first level referred to the foetus, the second level to the individual, and the third to the traces of each individual in the memories of other people. Mind now had a chronological dimension! Here Fechner conceptualized this as an explanation of life after death. Later in *Nanna* he cast the temporal variable onto the dimension of species other than human, and even onto cosmorganic development in *Über die physikalische und philosophische Atomlehre* (1855) and in *Einige Ideen zur Schöpfungs- und Entwicklungsgeschichte der Organismen* (1873). It seems plausible to see the hierarchy of consciousness as the embryonic idea for the measurement of intensity of sensation in the *Elemente der Psychophysik*.

Thus in *Nanna* he compared the phylogenesis of mental activity in plants to a similar phylogenesis in animals. He insisted that each kingdom had developed during the same time span. The discussion is naturally pre-Darwinian despite his evidence from the geological record that animals are as old as plants. He was concerned to argue that plants are equal to animals in some ways and different in other respects. The successive creation of plants had attained a higher stage of external complexity in the vegetable kingdom as compared to a higher stage of internal complexity in the animal kingdom. Another way of saying this was that plants had a higher degree of sensitivity, while animals had a higher degree of intellective ability:

I believe, in fact, that the plant is higher than we are, only in a lower realm. The sensory life (*Sinnesleben*), even though it is lower, may reach a degree of development which in us is lacking. The life of the senses has only to serve our higher life, whereas it manages its business independently in the plant.<sup>22</sup>

This hierarchy or continuum of mental life was confirmed by the asleep-awake analogy, for the plants were more often asleep, and the animals were more often awake. Fechner meant that the relation of asleep to awake was the relation of sensory awareness to intellective or spiritual<sup>23</sup> awareness. The earth consciousness (*Erdseele*) in *Zend-Avesta*, for example, subsumes the lower forms of awareness by remaining perpetually asleep and awake. As the planet spins on its axis, one side always faces the sun and remains awake and another side faces the darkness.

The following passage from *Zend-Avesta* suggests that Fechner thought of the highest level of the spiritual world as a functional relationship:

<sup>22</sup>*Nanna*, p. 57.

<sup>23</sup>The word is *geistig*, adjective or adverb, and *das Geistige*, noun. In the nineteenth century it had the double meaning of "spirit" and "mind". I will more often render it "spirit" because this carries the analogy better; the English reader should recognize that *Geist* has two meanings to the German ear.

Just as the lower spiritual phenomena (*das niedrige Geistige*) are expressed individually in material processes, so the higher spiritual phenomena (*das höhere Geistige*) can be understood as the interconnection of such material processes, a higher order, a higher relation, a higher change.<sup>24</sup>

In terms of the asleep-awake analogy the highest level of wakefulness would be a universal law of nature. Such a law of nature (*Naturgesetz*) appeared in the *Elemente der Psychophysik* nine years later, when Fechner based his psychophysical law on the law of the conservation of energy.<sup>25</sup> The conversion of potential to kinetic energy lent credence to the scale of "mental energy" from unconscious to conscious intensities.

It has been pointed out to me that the psychophysical law applies to the middle and not to the highest level of wakefulness.<sup>26</sup> This comment is consistent with the foregoing analogies, which were in review asleep : awake : : plant sensitivity : animal intellectuality : : lower spirit (of man) : higher spirit (of world). The psychophysical law is the functional relation between mental intensity and physical intensity, while the conservation of energy is the functional relation between potential and kinetic energy. The human law is an application of a natural law which is more general, or in Fechner's terms, the lower spirit is subsidiary to the higher spirit which is more abstract.

#### VII. THE FREEDOM-DETERMINISM ANALOGY

Out of the separate issues of mind and body, part and whole organization, and the scale of spirituality arose another issue which was perhaps more fundamental than any of the others. The last issue I will take up is freedom versus determinism and the analogies Fechner used to deal with it.

A new analogy was required to describe the aforementioned "order, . . . relation, . . . connection, . . . change" which occurred between the lower and higher levels of consciousness. The problem was to explain cause and effect, and Fechner's solution, as usual, was to cast the problem into an analogy. He reasoned that psychological events were controlled by laws of association in the same way that material events were governed by the law of gravitation. But if this were true, consciousness would have to forfeit its freedom. Fechner seemed to side with determinism, yet he did not rule out free will in this passage from *Zend-Avesta*:

In the psychology of the higher spirit, all of the laws of the intercourse and history of man come into play; as they come together with the psychological laws in our minds, so too the psychological laws of the higher and abstract realms come together with those of the lower particulate realms.<sup>27</sup>

The issue was resolved fifty pages further on, as Fechner enunciated his "final world principle" (*das höchste Weltgesetz*) for the first time.

<sup>24</sup>*Zend-Avesta*, II, p. 140.

<sup>25</sup>G. Th. Fechner. *Elements of Psychophysics*, trans. by Helmut Adler, ed. by D. H. Howes and E. G. Boring (New York: Holt, Rinehart, and Winston, Inc., 1966), Chap. 5.

<sup>26</sup>Comment by the anonymous referee for the *Journal of the History of the Behavioral Sciences* in July, 1969, with reference to the Master's thesis version of this paper.

<sup>27</sup>*Zend-Avesta*, I, p. 166.

Whensoever and wheresoever the same conditions recur, whatsoever these conditions may be, the same effects will recur, while under different conditions, different effects.<sup>28</sup>

The analogy which conveyed this principle of cause and effect most vividly and from which it may have come is the one about memories from childhood. Mental associations are formed during childhood. Though they soon fade away, they nevertheless continue to determine the course of future thoughts.

Do we not have within us for certain many unconscious mental connections and consequences? . . . yet they would not exist without the consciousness, for one would not be able to speak of them. I learn something as a child, unconsciously, i.e., I do not think about it again, it continues to have an effect up into my old age, it determines somehow the manner and the course of my later ideas. Nevertheless, if the ideas derived in my early learning were not connected with my later ideas in the same consciousness, they would be unable to have any effect on these at all.<sup>29</sup>

Fechner considered it paradoxical that we could be seemingly free to direct our thoughts back to childhood; for at the same time, our memories are determined by all the associations laid down in the meantime. In short, the analogy was freedom : determinism : : conscious memories : unconscious memories.

Therefore, like body and mind, the principle of causation had two sides. Indeed, Fechner had equated freedom with feeling and determinism with impulse in this analogy from *Nanna*:

As I see it, the question of freedom, in so far as it is essential to mind, comes to just this, that of every creature to which we attribute mind we must require only one thing, that it feels as its own the impulse to certain activities. That is enough. Whether this feeling of the impulse is born of necessity or not can be investigated, but however the answer comes out it cannot be held against the existence of the mind.<sup>30</sup>

I suggest that Fechner assumed in this analogy that the underlying physiological substrate and with it the impulse (*Antrieb*) could be causally connected. However, he emphasized the question of feeling in order to establish that the psychological consciousness was free. Elsewhere he said that it is a mistake to think of one side causing the other, because they both occur in the very same shoes.

In conclusion, the analogy of freedom : determinism : : feeling-as-one's-own-the-impulse : physiological impulse was conceived to prove mind in nature. In common with the analogy of conscious and unconscious memory, it assumes that all levels of consciousness are subject to a universal law of nature. This law is the final world principle and it states that due to the uniformity of nature all events can be described by cause and effect relations. Fechner had an intuitive understanding of the inductive principle of Hume, although he neglected to remove the requirement for necessity in the causal connection.<sup>31</sup>

<sup>28</sup>*Ibid.*, I, p. 210.

<sup>29</sup>*Ibid.*, I, p. 160.

<sup>30</sup>Lowrie, p. 194, in *Nanna*, p. 74.

<sup>31</sup>For her elucidation of the criteria for empirical validity of the inductive principle I am grateful to Marilyn E. Marshall.



## VIII. THE FUNCTIONAL RELATIONS

Embedded as it is in a prolix accumulation of analogy and fact, the central concern of Fechner is difficult to understand. The structural approach I took to describe his scientific solution to the mind-body problem has at least the merit of taking into account his analogical method; and at most it may convince the reader that Fechner's *corpus* is less schizoid than the Dr. Mises pseudonym had led him to believe.

Fechner reviewed his own reasons for positing mind in the 1861 book *Über die Seelenfrage*. The arguments were: (1) similarity, or analogy, (2) plenitude, (3) gradation, (4) interconnection, (5) causality, and (6) freedom.<sup>32</sup> In our schema, the asleep-awake analogy conveys plenitude and gradation: the notion that plants developed side by side with animals. The part-whole analogy conveys the interconnection, or the relation of sensation and movement, of activity and consciousness. Finally, the freedom-determinism analogy conveys through memory and feeling the law of causality underlying the rest.

I have presented the four analogies in order to reveal the maturation of Fechner's metapsychology. I recognize in them the embodiment of the following scientific relations: (1) the functional relation of consciousness to the inner world, (2) the functional relation of consciousness to the outer world, and (3) the functional relation of consciousness to itself, or to a continuum. Each had been elaborated through multifarious analogies before the logarithmic law occurred to Fechner on October 22, 1850. He required another ten years to crystallize these relations into an experimental psychophysics. The *Elemente der Psychophysik* was published in 1860 in two volumes, the first treating the outer psychophysics and the second treating the inner psychophysics. The functional relation in outer psychophysics was the increase of sensation in proportion to the logarithm of the stimulus magnitude. Although this sensation was not amenable to direct measurement, the psychophysical methods did enable indirect measurement of the just-noticeable-difference in sensation. The functional relation in inner psychophysics was the increase of sensation in some unknown proportion to nervous activity in the brain. Fechner placed both discussions in the second volume of the *Elemente*. He recognized that they were unanswerable on the basis of current physiological and psychophysical knowledge. He knew quite well that the first volume contained the scientific results, for it introduced the three psychophysical methods and assembled the data in support of Weber's law. The Weber fractions measured by many experimenters were Fechner's hypothetical mental unit, termed by him the just-noticeable-difference. Thus, even though the data for the j. n. d. came first in the *Elemente*, they came last in the development of the program of psychophysics. In the words of Fechner again:

It was the viewpoint of inner psychophysics which provided the inducement, whereas the outer psychophysics was merely drawn in as a subsidiary support for that viewpoint.<sup>33</sup>

The scientific genius of Fechner lay finally in his ability to construct an empirical metatheory through analogy. Playful in style, yet serious in content, his

<sup>32</sup>*Über die Seelenfrage*, p. 46ff.

<sup>33</sup>*Elemente*, II, p. 559.

analogical writings document the tortuous slowness of scientific discovery. In perusing Fechner I have found not only the analogy of literary style, though this surely pervades every page; I have also come to realize that Fechner meant analogy in a larger methodological sense. For instance he wrote that:

the combination of analogy and induction and the correction of analogy by itself, and the fact that by us likeness as well as unlikeness is taken into account, should diminish the insecurity commonly associated with analogy.<sup>34</sup>

Somehow Fechner managed to translate the fanciful and fantastic *Naturbetrachtung* "of matters of heaven and beyond" into the sober and sublime science of psychophysics. My answer to the historical riddle of this translation is relations. The middle term between analogy and physics is relations. Analogy is a similarity of relations; physics is founded upon the relation of dependent to independent variable. Only a physicist, indeed only a physicist bent on solving the mind-body problem empirically could have discovered this way of measuring mind. Let the mind make the only judgment it can make, the null judgment of equal or unequal sensations; and let the stimuli of this sensation be expressed as a fraction or a relation. Psychophysics then becomes the functional relation between the mental and the physical worlds where the ontological bridge is the analogy between my mind and yours.

## IX. A RADICAL DEFINITION

The rest of this paper will be devoted to enlarging the historical scope of our conclusion by an examination of other mind-body positions. Fechner's definition of mind was sufficiently radical to arouse the skeptical concern of his philosopher friends Christian Hermann Weisse and Rudolph Hermann Lotze. These men were exponents of the identity and monadology positions which Fechner went to pains to refute. Moreover, the predecessors of each man were also worthy of Fechner's opposition, namely F. J. Schelling and J. F. Herbart. The position of a naive Kantian scientist, Matthias J. Schleiden, will be my first point of comparison to Fechner's panpsychism.

In an essay on "The Animation of Plants", Schleiden took Fechner to task for his supposed claim that the plants have souls. The discoverer of the plant cell admitted that

the idea is not new, since we already possess a small library on the soul life of plants, and Fechner has adduced the most impressive reason for the truth of the view, which a democrat would at least have to let stand. The view has the majority in its favor: five hundred million Hindus and Chinese believe hard and fast in the existence of plant souls.<sup>35</sup>

However, he criticized him in his use of the words spirit and soul, and then he exposed two logical weaknesses:

Two chief mistakes are the pivots on which the entire book (*Nanna*) turns. The first is the light-hearted conclusion: the animals are besouled, the plants are truly no worse than most animals, consequently we must admit for them a soul.

<sup>34</sup>*Zend-Avesta*, I, p. xvii.

<sup>35</sup>Matthias J. Schleiden. "Die Beseelung der Pflanzen. Gespräch und Rechtfertigung." *Studien* (Leipzig: Engelmann, 1855), p. 135.

. . . The second chief mistake which Fechner commits is that he treats the matter teleologically everywhere, that is to say, he accepts the existence of the soul for reasons of purposiveness.<sup>36</sup>

Schleiden, it seems to me, has failed to understand that Fechner is not talking words but relations. Here is the conclusion to Schleiden's attack, as quoted by Fechner in *Professor Schleiden und der Mond*:

I have told you what I understand by spirit (*Geist*). This spirit appears to us to be bound to the body, and then I call it soul (*Seele*). Furthermore, by now I do not even have to tell you expressly that the mental life (*Seelenleben*) of animals and plants is not even worth discussing. I term spirit (*Geist*) only that which is independent of the laws of nature and is free to determine itself. As to the reality of it, there is no proof other than the possibility and reality of the moral struggle. Of this, only the human being gives me report.<sup>37</sup>

The nuances in Schleiden's usage of *Geist*, *Seele*, and *Seelenleben* are translated "spirit", "soul", and "mental life".<sup>38</sup> In fact, Schleiden expressed the prevalent distinction between the spirit, as something transcendent, and soul, as something attached to an individual.<sup>39</sup> Fechner's usage departed from the popular one, however. His reply to the discoverer of the plant cell placed the difference into sharp relief:

But why does Schleiden dispute me? I am completely in agreement with him that the plants and the animals do not have souls in that sense, rather in an altogether everyday sense, and even unphilosophical sense, whereas his explanation is the philosophical one. I will go still further than he. In my opinion, Schleiden, who is otherwise not tender-minded, has been too soft in allowing a soul to human beings. There is no soul at all in that sense, just a philosophical term for it.<sup>40</sup>

Fechner obviously had his own radical definition of *Geist*, *Seele*, and *Seelenleben*. Generally, I have translated these words in terms of "mind" or "mental life". In some cases, as in the preceding quotation, the context makes "soul" more appropriate. Fechner remained deliberately vague simply because it did not matter in terms of his scientifically clean concept of mind. He defined mind by abundant empirical analogies: analogies between the movements of plants and animals, the inner and outer bodily expressions, the asleep and awake levels of consciousness, and the free and determined course of memories. These analogies stretched and tested the relation of mind to body. Our translation served to anchor the discussion for the English reader, who might think of the mind-body problem, or who might be accustomed to view mind as a functional concept. The German reader probably

<sup>36</sup>*Ibid.*, pp. 156-157.

<sup>37</sup>G. Th. Fechner. *Professor Schleiden und der Mond* (Leipzig: Adolf Gumprecht, 1856), p. 88. Fechner took the quote from Schleiden, *Studien*, p. 174.

<sup>38</sup>James Mark Baldwin. *Dictionary of Philosophy and Psychology* (New York: The Macmillan Co., 1902), 3 vols. See summary definitions by G. E. Moore (spirit), J. M. Baldwin (soul, mind).

<sup>39</sup>Rudolf Eisler. *Wörterbuch der philosophischen Begriffe und Ausdrücke* (Berlin: Ernst Siegfried Mittler und Sohn, 1899). An excellent source of definitions by quotation from all the important pre-1900 philosophers.

<sup>40</sup>Fechner, *Schleiden*, p. 89.

had associations similar to those of Schleiden, and his task in coming to terms with Fechner was complicated by connotations of "spirit" and "soul". Thus the real misunderstanding between Schleiden and Fechner was due to the pouring of old wine into new bottles.

#### X. IDEALISM AND MATERIALISM

Fechner was not waging a spiritualist's battle against materialism. Instead, he was calling for a simple scientific solution to the mind-body problem. He recognized just two modes of appearance, the psychical and physical. He did not know what they were and he accepted them as givens. For him, the observation of empirical relations between stimulus and movement, and the inference of mind, did not require a conclusive answer as between Cartesian interaction and Leibnizian parallelism. The reason for this rested with Fechner's ontology, or lack thereof. He did not ask "what is mind?" but "how does mind function?". The monism of functional relations handled the dualism of double-aspect in his scientific world view.

The opponents, as Fechner conceived them, were idealists and materialists, and the issues were identity and monadology. He established his psychophysical law on the basis of his counter to these two prevailing mind-body positions. In Chapter 19 of *Zend-Avesta*, entitled "Basic View on the Relationship of Body (*Körper*) and Mind (*Geist*)", he sketched his replies to six mind-body positions, and he concluded with a supplement "On the Closer Physiological Conditions of Objective Bodily Sensation" and another on "A Short Presentation of a New Principle of Mathematical Psychology". The program of the succeeding decade, and the break of experimental psychology from empirical psychology, is contained in this astounding fifty-page chapter.

Fechner dealt first with the "common view" that body and soul are two fundamentally different substances; he dealt second with the view that they are fundamentally the same substance. He introduced the discussion with an anecdotal report of a conference of philosophers held in Gotha on September 23, 1847. The dialogue included the following exchange between representatives of materialist and idealist viewpoints; the materialist spoke first:

According to the opinion of the speaker, there would be in things something other than the thing itself; oxygen would not be oxygen, but the thought of God . . . .

The idealist answered:

Through his speaking my opponent directly contradicts what he is saying. He claims that oxygen is not thought, but simply oxygen. In the very fact that he is speaking of oxygen, he must indeed have an idea of it himself.<sup>41</sup>

Fechner commented that "the vulgar conception here seems more correct than the philosophical one."<sup>42</sup> However, he disclaimed the scientific materialism which compared thinking as a function of the brain to gall secretion as a function of the liver. If we substitute "movements in the brain" for "thinking," then the comparison

<sup>41</sup>*Zend-Avesta*, II, pp. 149-150.

<sup>42</sup>*Ibid.*, p. 150.

holds true; yet we must not confuse the standpoints of outer observation, i.e., of brain activity, and of inner observation, i.e., of thinking. Fechner's solution to the mind-body problem was as scientific as it was original.

### XI. MONADOLGY AND IDENTITY

Both materialists and idealists made the error of separating body substance and mind substance. Fechner referred to monadology as the epitome of this mistaken dualism. In an 1852 essay, "A Critique of the Foundation of Herbart's Metaphysics,"<sup>43</sup> he again cast the debate into a dialogue between the Herbartian and himself. The Herbartian said that you could throw a plant into the fire and then call the ashes its essence. The essence, in short, was the permanent part or that which outlasted change. Fechner answered that the essence of the plant was in the living unity of the plant, a unity comprising the movements of the parts in mutual dependency on the whole plant.<sup>44</sup> Herbart's "definition of being" (*Seynsbegriff*) had left untreated the basic facts of observation. Fechner concluded dryly:

I believe, nevertheless, that it depends whether one wants to divorce scientific knowledge from life.<sup>45</sup>

Refusing to split experience into the categories of phenomenon and noumenon or subject and object, Fechner insisted upon a naive scientific observation of "everything which is given to me and to others through experience."<sup>46</sup> He had already distinguished the causal consequence of this ontology in Chapter 19 of *Zend-Avesta*. It was essentially the monadology of Leibniz, and it bore only a superficial resemblance to double aspect. The parallelism of the two clocks in preestablished harmony is really one and the same clock seen from two points of view.

The other error committed by materialists and idealists was in fusing body substance and mind substance. The various identity theories represented this mistaken monism. Now the protagonist was Spinoza, along with Fichte, Schelling, and Weisse. Fechner believed that his double-aspect viewpoint came closest to the philosophy of Spinoza, and he wrote that

Spinoza's view, like ours, permits a double conceptualization, material and spiritual, of the realm of existence; it takes one being (substance) as identical, first in body (under the attribute of extension), and then again in mind (under the attribute of thinking); and it follows this up by combining both conceptualizations through the substantial identity of the primary being.<sup>47</sup>

Clearly Fechner's earth spirit, or *Erdgeist*, had much in common with Spinoza's confusing concept of God. God was not a personal being, but the substance or

<sup>43</sup>G. Th. Fechner. "Zur Kritik der Grundlagen von Herbarts Metaphysik." *Zeitschrift für Philosophie und philosophische Kritik*, Vol. 23, 1853.

<sup>44</sup>Fechner, *op. cit.*, p. 72. Fechner's example of the "being of the plant" (*Seyn oder Seyenden der Pflanze*) is his own. He refers to the "circle of reciprocal dependency" in "Herbart, Metaphysik, Section 205." Possibly he had the fourth edition of the collected works of Herbart: Johann Friedrich Herbart. *Schriften zur Einleitung in die Philosophie*, 4 Vols. Ed. by G. Hartenstein (Leipzig: Voss, 1850), which contains the "Einleitung in die Metaphysik" in volumes I and II. The publication of this edition in Leipzig in 1850 may have instigated the Herbart revival and the controversies about him in Leipzig during the 1850's.

<sup>45</sup>Fechner, *ibid.*, p. 76.

<sup>46</sup>Fechner, *ibid.*, p. 72.

<sup>47</sup>*Zend-Avesta*, II, p. 155.

"Real" with attributes of both thinking and extended being.<sup>48</sup> Fechner disagreed with this view on just two fine points. Regarding causation, Fechner saw that if mind and body are conjoined as attributes of one substance, then they cannot "cause" each other; hence, the ordering of the material world according to mental intentions would be ruled out, and there would be no teleological causality.

Fechner therefore offered a way for the two sides of reality to encroach upon one another. His solution was the "changing of standpoint" (*Standpunktwechsel*),<sup>49</sup> a *tour de force* of systematic reasoning on his part, since it also solved the other point of disagreement with regard to ontology. According to Spinoza, the two "attributes" of being were thought and extension; both had to be considered at the same time. Fechner differed in calling the attributes "appearances," and he insisted that a "change of standpoint" was scientifically necessary in order to regard the two sides of reality as one and the same. In other words, Fechner altered a contradictory double-attribute ontology into a straightforward double-aspect methodology.

The truth is that it did not matter to Fechner how the ontology of his world system was construed, so long as his empirical methodology was understood. Observation had to take place from the inner or outer standpoints; the underlying reality may be one or many, but this need not confuse the observation of its two appearances. The philosophers whom Fechner called "monadologists" made the mistake of separating mind from body, as Herbart did with his definition of being, and as Leibniz did with his parallel clock universe. The other philosophers whom Fechner opposed were those who adhered to a *naturphilosophische* claim of "identity" of mind and body, such as Oken and Schelling with their "Absolute," or Spinoza with his "Real." The Fechnerian polemic against the proponents of monadology and identity metaphysical positions was resolved, therefore, through the method of functional relations. Even Lotze, who posited "reciprocal action" and Weisse, who approved the hypothesis of life after death, were incapable as philosophers of foreseeing the significance of this simple-empirical methodology. It remains to take up the indulgent critiques of these two contemporaries of Fechner.

### XII. THE MONADOLOGIST CRITIQUE

The mind-body position of Fechner meant one thing to him and another to his audience of readers. He gave this report on the reception of *Nanna* and laced it with sardonic wit:

Almost undivided applause was encountered from the ladies; the testimony has come by mouth and by letter; it was as if the soul of the tender plants had encountered a host of sisters. Almost as unanimous was the castigation from the natural scientists and professional philosophers; the testimony came, by mouth and by letter, from acquaintances and strangers; it was as if the poor soul encountered there no soul at all.<sup>50</sup>

Evidently the notion of mental life in plants was more appealing to the women than to the scientists and philosophers. Notice that *Seele* has been rendered "soul" once

<sup>48</sup>My secondary source is B. A. G. Fuller. *A History of Philosophy*, rev. ed. (New York: Henry Holt and Co., Inc. [1938] 1945), p. 75.

<sup>49</sup>*Zend-Avesta*, II, p. 155.

<sup>50</sup>Fechner, *Schleiden*, p. 5.



more to show the influence of context. Because of this very susceptibility to looseness, Fechner's topic became suspect, and the physicists and physiologists found even less to intrigue them into reading beneath the words.

Among the philosophers, R. H. Lotze and C. H. Weisse alone seem to have applauded the style and conception of *Nanna* and *Zend-Avesta* in Fechner's time. It so happens that Lotze was a monadologist, a follower of Leibniz as well as a student of Weisse! Weisse was Fechner's closest friend, a follower of Schelling and a philosopher of religion in the "Absolute" or identity tradition. Thus, the two men make convenient poles in the materialist and idealist camps, respectively, for an assessment of Fechner's definition of mind.

Lotze criticized the argument for mind when he reviewed *Nanna* in 1850.<sup>51</sup> Although he praised the inspired collection of detail about the plants, he set up two requirements for establishing the presence of mind: (1) the observation of events which require for their explanation a "characteristic immaterial principle," and (2) the recognition of an organic design which is made comprehensible by the assumption of the principle. With regard to (1), he stated:

The numerous presentations which the author has given in this sense carry the significance in any case of a *tabula rasa* for the production of a positive opinion, to the founding of which they contribute nothing.<sup>52</sup>

In other words, Fechner had cleared the slate of objections to mental lives in plants, however he had failed to prove their existence. Concerning (2), Lotze wrote later on in his book *Medicinische Psychologie oder Physiologie der Seele* of 1852 that Fechner had not gone far enough. Animation (*Beseelung*) once embraced must be followed through consistently:

Should that extension of animation enthruse the conviction, then it may not be taken up testily here and there; rather, it must stretch over everything existing. One has to realize that all the ideas of materials and forces underlying mechanical physics are not indications of principles but of results which have not yet been followed back to their psychical origins. That conviction of the sole reality of the mental world, which Empedocles once stirred by deriving the natural occurrences from love and hate, and which Leibnitz has profoundly renewed among our countrymen, must compel us to presuppose the hidden workings of mental forces in the movements and activities of unliving and unorganized materials.<sup>53</sup>

The style of Lotze is diffuse and difficult; the style of Fechner is profuse and playful. Did they disagree on the extent of minds in nature? Lotze seemed to think so in 1852. He concluded his remarks in the *Medicinische Psychologie* as follows:

We go in this respect far beyond that which Fechner has claimed about the mental life of plants. Perhaps because of his limitation of the question to one

<sup>51</sup>Rudolf Herman Lotze. "Recension von Gustav Theod. Fechner, *Nanna, oder über das Seelenleben der Pflanzen*" in *Kleine Schriften*, 3 vols. (Leipzig: Verlag von S. Hirzel, 1886) pp. 505-512. This review and many others from Lotze have been published originally in the Göttingen newspaper. The reference for the above is *S. Gött. gel. Anzeigen*, Stück 167, 1850.

<sup>52</sup>Lotz, *op. cit.*, p. 509.

<sup>53</sup>Rudolf Hermann Lotze. *Medicinische Psychologie oder Physiologie der Seele* (Leipzig: Weidmann'sche Buchhandlung, 1852), p. 133.

part of organic creation, the view of this astute scientist has acquired the appearance of unprincipled and chance origination. This seems to have caught the eye of the physiological readers before the somewhat hidden foundations of his view.<sup>54</sup>

The misunderstanding of *Nanna* among the physiologists was therefore due to the failure of Fechner to follow out this principle of animation in nature at large.

Yet Fechner had already finished exactly this program! The *Zend-Avesta* was published in 1851. Lotze wrote a review of it that came out on January 17, 1852.<sup>55</sup> The *Medicinische Psychologie* went to press at Easter, 1852, and in it Lotze criticized Fechner's *Nanna* for its limited conception of panpsychism:

One cannot search for the mind arbitrarily in the plants, the darlings of our phantasy, and remain satisfied with the existence of dead matter in the rocks.<sup>56</sup>

Apparently Lotze wrote this passage before the *Zend-Avesta* came to his attention. In a letter of May 31, 1851, he commented that his poke was a return gift for Fechner's misrepresentation of his view in *Nanna*.<sup>57</sup> Fechner had interpreted *Gemüth* and *Triebkraft* as the opposite of what he had meant, wrote Lotze. The discrepancy lay in the interpretation given to "disposition" and "motive force." Fechner mistook an animistic argument for a mechanistic one. Was this a trivial point? Lotze thought that the difference in their systems was negligible. Only the terms were different. He stood for a thorough-going animism in "reciprocal action" with a thorough-going mechanism, a view not dissimilar to Fechner's.

The import of this misunderstanding between Lotze and Fechner is that they were really closer than they thought in 1851 on the issue of body and mind. In fact, Lotze virtually acknowledged this when he finally read and wrote a review of *Zend-Avesta* in January 1852:

The view that all of Nature is alive is one that the author seeks to justify not through the force of new reasons, but through the force of those ancient ones from which it has proceeded and toward which natural religions it has grown, as the title of this work reminds us. It is not a matter of introducing this view in that vagueness which comprises an accustomed portion of modern sentimental prose. Rather, starting out from the relations of physical nature and a thorough consideration of all the meaningful connections, in a sensitive empiricism introduced by general ideas but not abstract premises, the author seeks to comprehend the over-all animation of the world in its more definite relations to the individual aspects of single creatures, and from the latter to show in reverse what meaning and consequences have grown out of the general interconnection in the spiritual realm.<sup>58</sup>

<sup>54</sup>*Ibid.*, p. 133.

<sup>55</sup>R. H. Lotze. *Literarisches Centralblatt für Deutschland*, January 17, 1852, Column 39-40. This review appears in the addenda to Richard Falckenberg. *Hermann Lotze* (Stuttgart: Fr. Frommanns Verlag (E. Hauff), 1901), pp. 179-180.

<sup>56</sup>Lotze, *Medicinische Psychologie*, p. 132.

<sup>57</sup>*Nanna*, p. 62. Lotze's letter of May 31, 1851 to Fechner is quoted in Falckenberg, *op. cit.*, pp. 126-127.

<sup>58</sup>Lotze, *Literarisches Centralblatt*, Column 39. See Footnote no. 55.

Their terms were different, yet they had long held to closely similar definitions of mind. Fechner's argument from parts and wholes, for example, pointed to interconnection as a defining characteristic of animation. Lotze discussed the constituent parts of organic wholes in terms of "reciprocal action" in his classic essay of 1846, "Seele und Seelenleben":

The whole difficulty in this question is that those who speak so much of the introduction of physical and mechanical explanation into physiology . . . have considered the reciprocal action (*Wechselwirkung*) between minds and bodies to be an exception; in other words, those people who have given precious little thought to the basis of a psychical mechanism are the same ones who hold that interaction is an example of a causality wherein the inner connections are not even comprehensible.<sup>59</sup>

Fechner and Lotze had in common a monistic metaphysics and a dualistic epistemology. They each claimed an alternating stance on the central issues of causation and mind-body ontology. Lotze believed that reciprocal action was the relation of one object to the whole; the relation was the concomitance of body and mind in uniformly corresponding change. Fechner also conceived the interconnection in ongoing activity as a relation:

The foremost difficulty of our task lies, after all, not in the fact that we are accustomed to regard the mind as a rule, but as an exception in nature. If all nature is animated, then the only question involved is what is individually animated and at what level of animation does it stand in relation to the others.<sup>60</sup>

In other words, the elements of the world, from atoms to men, stand in some lawful relation to each other. The statement that mind is no exception to the rule requires the assumption of a unitary being. Thus the two men harmonized the laws of nature with the assumption that reality is a unity.

### XIII. THE CHRISTIAN CRITIQUE

Fechner had solved the mind-body problem for the Christian by his theory of immortality. Derived from the asleep-awake analogy, it was a double-aspect theory of death in this life and rebirth in the next life. C. H. Weisse responded to the *Zend-Avesta* in 1854 with a lengthy review entitled "Christianity and the Hypothesis of the World Soul."<sup>61</sup> He praised Fechner for "the complete freedom from all dogmatism, not only of theologians but of philosophers."<sup>62</sup> Considering that Weisse was a philosopher of religion not to mention an orthodox Christian, his enthusiastic affirmation of Fechner's empirical view is the more convincing. He even recognized the point where Fechner stopped short of the keynote of Weisse's own philosophical training under Schelling, the "Absolute":

<sup>59</sup>R. H. Lotze. "Seele und Seelenleben" (*S. Gött. gelb. Anzeigen*, 1846), in *Kleine Schriften*, op. cit., vol. II, p. 163.

<sup>60</sup>*Zend-Avesta*, I, p. 4.

<sup>61</sup>Christian Hermann Weisse. "Das Christenthum und die Hypothese der Weltbeseelung." *Protestantische Kirchenzeitung für das evangelische Deutschland*, September 16, 1854, No. 38, pp. 923-939.

<sup>62</sup>*Ibid.*, p. 926.

Fechner will have nothing to do with the dead abstraction of the Absolute, which has unfortunately penetrated so deep into the theology of the Church.<sup>63</sup>

Actually, Fechner had once been swayed by the notion of the "Absolute," and he recorded his reaction to Schelling in a footnote in *Zend-Avesta*:

With Schelling's identity theory, on the other hand, I can find no clear point of contact, for his entire view appears unclear to me from the ground up; however, it was a work rooted in Schelling's perspective (the *Naturphilosophie* of Oken) which first drove me, through its titanic keenness, above and beyond the vulgar view of nature, and in its own direction for some time.<sup>64</sup>

The identity inherent in the idealism of Schelling, Fichte, and Oken was rejected by both Weisse and Fechner. The "Absolute" was aesthetically attractive because it combined subject and object into a unity. Nevertheless, it neglected the "riddle of Christian belief" for Weisse, and it ignored the verification by reference to empiricism for Fechner. Weisse saw the key to the mutual acceptability of the Christian and the panpsychistic viewpoints in the eschatological hypothesis. Regarding Fechner's concept of life after death, Weisse wrote that

. . . it has been brought into such a close relation to the acceptance of a personal earth spirit that he himself would probably not find it strange if we express the opinion that it must stand or fall on this.<sup>65</sup>

Indeed, Fechner had written in the Preface to *Zend-Avesta* that his views usually contradicted his friend Weisse's, yet in respect to the eschatology of Christianity they paraphrased the latter's belief.<sup>66</sup> Fechner came to terms with the doctrine of death, resurrection, and immortality by portraying the death of Jesus Christ as the point of unification of man with God.<sup>67</sup> The Christian believes that all men should work together for salvation, and the body of Christ is the memory and the promise of a future life. The subtitle of *Zend-Avesta* summarized Fechner's religious view: "on matters of heaven and beyond" referred to loving one's neighbor in this life and joining God in the after-life. Of course, Fechner did not overstep the empirical memory view of life after death, the one he conceived through the asleep-awake analogy in *Das Büchlein vom Leben nach dem Tode*. Fechner felt that he was in accord with this eschatological point of Christian belief:

Christ is not yet dead; what comes from Him, what returns to Him, is under Him, and is His; what forwards His cause, belongs to Him. And insofar and insowide as this book is good, it is in my opinion part of Him and it belongs to Him.<sup>68</sup>

I am not sure that he would let his work stand or fall on this point, as Weisse suggested above, for the same reason that he was not particular about differentiating "spirit", "soul", and "mind".

<sup>63</sup>*Ibid.*, p. 926.

<sup>64</sup>*Zend-Avesta*, II, p. 155.

<sup>65</sup>Weisse, op. cit., p. 938.

<sup>66</sup>*Zend-Avesta*, I, p. 12.

<sup>67</sup>*Ibid.*, I, p. 327.

<sup>68</sup>*Ibid.*, I, p. 327.

## XIV. CONCLUSION

Weisse may have been satisfied with Fechner's interpretation of life after death, but the scientific community was not. The extension of the concern of a physicist to matters of religion was enough in itself to make this panpsychism suspect. The philosophical community meanwhile treated Fechner with silence, the harshest criticism of all. Only Lotze came close to understanding that interconnection was the characteristic of Fechner's earth soul. Though the words were old, the method was new; using analogy before induction, he discovered the relations for the scientific study of mind.

The conclusion I draw is that the genesis of psychophysics required the mind of a physicist. The functional relation was second nature to a physical scientist who understood which questions were susceptible to experimental treatment and which were not. Gravity, for example, was not. Newton called it an occult quality and resigned himself to the description of its effects, not its essence. And Fechner knew that the essence of mind was not open to us:

... in the absence of a direct and exact measure of the appearances in the mental realm, we have need of a definite mathematical relation of dependency between the physical and mental appearances, one that will draw upon the experimental determination of limiting conditions, change and turning points, increase and decrease, outweighing and underweighing, superordination and subordination of mental phenomena. This can all be judged, though without exact measure, yet exactly with the sense of feeling or the consciousness; and on the principle of this relation of dependency it will be possible to compute the quality of the mental phenomena just as physics has computed the quality of colors and tones . . .<sup>69</sup>

Psychology became a science when man asked nature the right questions: not 'what is' the substance of mind, but 'how does' it function. The importance of Fechner's analogical world view was that it suggested the functional relations for the experimental psychophysics.

<sup>69</sup>*Zend-Avesta*, II, p. 169, quoted from the second supplement, "A short presentation of a new principle of mathematical psychology."

## HOW DO YOU SPELL PAWLOFF?: A NOTE

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... applicable title might read "Variations in the spelling of the names of important Russian psychologists." This semantic irregularity was encountered while researching primary and secondary sources for a forthcoming volume entitled: *Eminent psychologists: primary and secondary references*. Six Russian psychologists were selected to appear in this volume by an international panel of psychologists (Annin, Boring and Watson, 1968). In attempting to verify the primary bibliographic sources for these individuals, this author consulted many of the major resource materials that were available (Bagg, to be published). It was found that the verification process was severely inhibited by the varieties of spellings used to identify these psychologists.

The particular individuals being researched were V. M. Bekhterev, K. N. Kornilov, I. P. Pavlov, S. L. Rubinstein, I. M. Sechenov and L. S. Vygotsky. It was felt that inclusion of the note was necessary to facilitate other researchers' work in the area of Russian psychology in particular or the history of psychology in general. Cognizance of the inconsistency in the spelling of these names is essential in employing key research materials. The problem is basically twofold, that of location and/or recognition. Obviously, if the differential spellings affect the first few letters of the name, this will create difficulty in locating the name in an alphabetical listing, for example, Vigodski, Vygotsky and Wygotzky. However, even if the variants are reflected in the closing syllable, it is, in some instances, difficult to recognize with confidence that the two forms are equivalent, for example, Rubinshtejn, Rubinshteyn and Rubinstejn.

Once an individual is located within a volume, the assumption cannot be made that all references in that volume are under that particular spelling. For example, nine different spellings were found for Vygotsky in the *Author index to Psychological index (1894-1935) and Psychological abstracts (1927-1958)* and supplements thereof while three each were found for Bekhterev and Pavlov. Though the first names of these individuals are also inconsistently represented, it was felt that these differences were not crucial to the researcher since the initials will suffice in locating an author if the various spellings of the last name are known.

The spellings below constitute those that were encountered in the sources consulted. It represents, by no means, an exhaustive list of possible spellings as other transliterations are possible. The discrepancies result from the varieties of translations but a more precise definition would go beyond the intention of this paper. The italicized spellings are those which will be used in the volume on eminent psychologists mentioned earlier. According to Watson (personal communication), the spellings chosen were those most familiar to American psychologists. As is desirable, a system without diacritics or ligatures is used by the Library of Congress and the following spellings are most often encountered in that source: Bekhterev, Kornilov, Pavlov, Rubinshtejn or Rubinstein, Sechenov or Siechenov, and Vygotskii. This reference source is the standard from which the libraries derive their spellings.

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