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## INTRODUCTION

- 1 My talk falls into three parts. First I will introduce myself. Second I will introduce you to me. Third comes the talk itself.
- 2 I would like the first part, my personal introduction, to bear the motto: “Woe unto him that sitteth in the seat of the mockers.”
- 3 As many good citizens of Basel here present will gladly testify, my family, on both sides, have always been peculiarly given to offending well-meaning citizens because it is not our custom to mince words and, wearing an amiable smirk, to wheedle our honorable, highly estimable uncles, aunties, and cousins with flattering ways. It would also appear that I was born in an evil hour, for I always speak and behave just as my black heart prompts me to do. The resultant mental, verbal, and physical conduct is classified, in the inflexible columns of the great account book known as good breeding, under the headings “rudeness,” “incivility,” “impropriety,” “insolence,” “cheekiness,” “unmannerliness”—all words that I invite you to look up in any pupil’s register for the lower grades. I still suffer from this pathological trait and propose to turn it to good account right now, when fortune has decreed that I should bring in my sheaves—a time when it would be a great wrong to bind the mouth of the ox which treadeth out the corn.
- 4 (I account myself fortunate that the exalted, highly estimable and exceedingly wise “Committee for Public Welfare” has made it possible for me today to unearth a few pieces from the junkroom of my decrepit brain.)
- 5 It is customary to begin every lecture with a *captatio benevolentiae lectori sive auditori* (a petition for the indulgence of one’s gracious reader, or rather, audience). For me it is even more essential than for others, to beg such indulgence. And yet so ignorant am I of the ways of the world that I really do not know how I am to cast my repellent person and repellent speech into such a mold as to merit indulgence. Regrettably it did not occur to me until yesterday that a Committee on Aesthetics has very sensitive ears which can tolerate neither a whoop of joy nor a raised voice, neither a vigorous

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expression nor a boisterous phrase. I pray this exalted commission may pardon me and, if they please, graciously show me how to tone down my personality and my speech so that even sensitive freshmen can listen to my talk without suffering any damage to their aesthetic sensibilities.

- 6 I am well aware, inconsequential being that I am, that I as a person must be repugnant to a titular committee, as well as to every right-thinking citizen, and that what they would really like is to ship me off to hell, signed, sealed, and delivered. Thus I address to them the most lively entreaties that they lead this prodigal back onto the path of virtue—and not me alone, but also my friends, who are infamous and unscrupulous in the extreme. I beg that I—this black sheep which, alas, can do nought but bleat out what sheepish understanding inspires him to say—may nevertheless be accepted into the society of men, where people tell each other the truth only when they are intoxicated and where, when they are sober, they lie to each other with such disarming guilelessness that Their Honors the Devil and his dear grandmama really get a kick out of it all.
- 7 I welcome someone to instruct me how to acquire good breeding, and how to walk through the streets like a marionette with a fresh coat of paint on; how much a person has to lie before people will believe he is telling the truth; and how to emulate those virtues, possessed by a titular committee, which shine like beacons before us to show us the way.
- 8 If, during the talk which is shortly to begin, I should arouse universal displeasure, I ask that this be attributed to my naïveté, to the fact that I have not yet succeeded in plumbing the deeper mysteries of a semi-official tribunal whose members wear such a jovial and friendly mien.
- 9 I ask forgiveness if this introduction appears somewhat incongruous in the context of the title given my lecture, yet I could not very well have chosen a different approach, given the rule that one must pay people back in their own coin.
- 10 The purpose of this first part of my address was to introduce myself to you. The purpose of the second introduction will be to introduce you to me.<sup>1</sup>

<sup>1</sup> There is no indication in Jung's manuscript where the introductory part ends and the text proper begins.

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- 11 My intention, in venturing to dedicate my little talk to a theme unrelated to the most eminent aspect of our motto *Patria*, is to make a modest contribution toward the elucidation of certain questions that might have remained open in the intriguing talks of members of our local group during the last winter and summer semesters.<sup>2</sup> I speak of “certain questions that might have remained open” not because the papers just mentioned failed to do justice to their themes but, quite the contrary, because their exposition was so outstanding that they opened up a whole series of supremely interesting questions. For it is the hallmark of good papers or talks that they always suggest more of the scope of their subject-matter than they can actually treat.
- 12 Most of us heard both the aforementioned lectures, and no doubt all of us asked ourselves questions whose import transcends the confines of any single discipline and which must be of the most vital interest to every educated person. The problems involved are not a matter for specialists but for all human beings, and their objective or subjective solution is—or ought to be—the imperative concern of every thinking man.
- 13 As we all know, the principle of inertia is not confined to the field of physical phenomena but also represents a fundamental law of human thought. As such it is an even more powerful factor in the development of world history than stupidity.<sup>3</sup>

<sup>2</sup> *Marginal note:* (Cf. G. Pfisterer, “Die Herkunft der lebenden Wesen,” *Centr. Bl.* August, 1896; and Stähelin, .)

Jung left the reference just so. Correctly: Georg Alfred Pfisterer, “Die Herkunft der organischen Wesen” [The origin of organic beings], *Centralblatt des Schweizerischen Zofingervereins* (Zurich), XXXVI:10 (July 1896), 609-631; and Karl Rudolf Staehelin, “Die verschiedenen Erklärungen des Lebens” [Divers interpretations of life], *ibid.*, XXXVI:6 (April 1896), 387. Pfisterer (1875-1968), M.D., became a practicing physician with an interest in holistic medicine; Staehelin (1875-1943), M.D., became a professor of internal medicine, Basel University.

<sup>3</sup> Jung interpolated this paragraph and the five that follow, through the two quotations from Kant. He may have intended that the text proper follow thereafter.

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- 14 This principle of *inertia*, innate to humankind, permits us to comprehend why nowadays, in the age of the hypercritical mind, we still see educated people in every walk of life—and not least among them physicians and natural scientists—who are not ashamed to proclaim their adherence to materialism, thus bearing witness to their own intellectual poverty. To be sure, one cannot blame these people too much, for they are only aping a well-known model, that is, parroting what Papa DuBois-Reymond is saying in Berlin.<sup>4</sup> After all, we cannot demand that everyone should think for himself. Given this fact, the ultimate solution might be a “revolution from above,” but any revolution of this kind will be a long time coming, and it will take the labor of several decades before the inert masses are set in motion. Although I know it is a waste of energy for me to combat materialism, nevertheless I hope to help draw a clearer portrait of this absurd colossus with feet of clay.
- 15 To this end, in the present study I attempt to supply a critical description of the theories and hypotheses of the exact sciences, insofar as these play a decisive or fundamental role in contemporary attitudes. I will discuss only those theorems absolutely essential to my exegesis, and of these only the most important and the best known.
- 16 The principal purpose of this critical exercise is to point up certain contradictions. If it remained faithful to this character, its result would be negative, taking the form of an insoluble dilemma. But as no reader would be satisfied by this, I have undertaken to draw the obvious conclusions from my results, in order to reveal the necessary metaphysical presuppositions of any physical process. This will make it possible to counteract the purely demoralizing effect of the critique, and we will arrive at a positive result which might serve as a solid point of departure for further critical excursions in the realm of metaphysics.

<sup>4</sup> Emil Heinrich DuBois-Reymond (1818-1896), a native of Berlin and professor of physiology at Berlin University, founded the modern science of electrophysiology and was the first to study electrical activity in nerve and muscle fibers. He collaborated with German physiologist Hermann von Helmholtz, and the two of them, with Carl Ludwig, influenced biological thought in Europe through their attempt to reduce physiology to applied physics and chemistry. This approach had a deep impact on the psychological theories of Freud and helped to strip from physiology all vitalist theories which regarded matter as arising from a “life force.” Later in these lectures Jung alludes to this “mechanist-vitalist controversy.”

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17 I could, in my view, choose no better *captatio benevolentiae* than two quotations from Kant, with which I introduce my essay to the public:

18 “For every substance, even a simply material element, must possess an internal activity as the cause of its external operation.”<sup>5</sup>

19 And: “Whatever in the world contains a principle of life appears to be immaterial in nature.”<sup>6</sup>

20 As we all know,<sup>7</sup> there are people—I am speaking only of so-called “educated” people—who knock about the world packing a whopping bundle of erudition, but who, down to the day they reach “the cold, cold grave,” do nothing but label the contents of their bundle as conscientiously and meticulously as they can, and whenever a favorable opportunity presents itself, open up their little store of goods and bask in the reverent awe of the uninitiate. But in the process they neatly discard anything and everything that might in the slightest way disrupt the sublime order of their little curio shop. Disagreeable troublemakers who want something other than second-hand bric-a-brac are gotten rid of, by means that are quite aboveboard, at the first convenient opportunity. This tactic guarantees the reign of universal peace in the realm of science, and friction between individual scholars over issues involving their specialties only sets this in sharper relief. The scholarly world as a whole is like an ocean whose mirror surface remains serene and flawless. Everyone is happy, and people raise each other’s spirits by pointing out that everything has been explained and divided into beautiful, orderly, functional compartments. To be sure, no one person knows everything, that is, no individual run-of-the-mill scholar knows everything, but he has access to all the help he needs, in the form of people known as “authorities on the subject,” i.e., people who, as everyone is aware, know more than ordinary scholars and who, in all seriousness, assure us that everything is going smoothly and functioning just as it should. However, as a rule there is no need to summon these temporary emergency assistants, as

<sup>5</sup> Immanuel Kant, *Träume eines Geistersehers, erläutert durch Träume der Metaphysik* (Leipzig, 1899), Part I, p. 15. (Tr. E. F. Goerwitz: *Dreams of a Spirit-Seer, Illustrated by Dreams of Metaphysics*, London and New York, 1900.)

<sup>6</sup> *Ibid.*, p. 14.

<sup>7</sup> In the holograph, this paragraph and those that follow until the asterisk are stricken out by a light line of the pen.

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for their day-to-day needs people can rest serene in the mere knowledge that these “authorities” exist. In fact it is said that a great many—who knows, perhaps most—just swim along with the tide without even needing to rely on this reassuring thought. They are the luckiest of all, educated people like children tasting honey, who can nibble at the sweetness of scientific knowledge with impunity. They are free to enjoy, more or less innocently, the golden light of day. For them there are no questions, no riddles, nothing exalted and nothing profound, no bright and no dark. Their thoughts and feelings, their philosophy and their religion, culminate in a single thought: a certain individual exists, his name is such and such, he lives there and—vegetates.

<sup>21</sup> Have I gone too far, I wonder? I think not. But a simple method exists by which to determine the accuracy of my portrayal: let us simply ask ourselves the question, what are the subjects that interest people most, and to what field do these subjects belong?

<sup>22</sup> To answer this question I shall allow myself to pick only a few blossoms from a garland and offer them to you like a little nosegay.

<sup>23</sup> If I were to select only the most extreme examples of those subjects that are of interest to educated people, I would first be compelled to find an audience that has forgotten how to blush. For nowadays it is by no means rare to see an educated man, even a scientist, weltering in the vilest slime.<sup>8</sup> But there is no reason to discuss this, for such conduct is also quite unpopular even with so-called educated people. Instead let us choose another showpiece from the junkroom of erudite absurdity. Something really impressive: Mammon. Anyone who is not interested in money in one form or another, is deemed to have played his cards all wrong and missed out on the real purpose of his life. It might be worthwhile, for once, to estimate approximately how many people belong to that great confraternity who strike up a *Te Deum* when the interest rate rises 1 percent. Naturally I would also include in this group all persons who study for venial purposes or who have set their sights on “marrying well.”

<sup>24</sup> Are we perhaps being overly conservative if we estimate that 90 percent of all educated people belong to the great “Salvation Army”? I think we can be content with this figure as a start.

<sup>8</sup> *Deleted sentence:* The discriminating intellect of man is operating on a level that would disgust a pig.



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- 25 I will take the liberty of stating my humble opinion: I consider it disgraceful for an educated man to accept the idea of the preeminent power of money. It is even more disgraceful if he tips his hat and shows his reverence to a sack of gold. But it is most disgraceful of all if he uses—or rather abuses—his knowledge and skills to gain bliss from the one thing that can give it, the personal possession of Mammon.
- 26 Ought I perhaps to cite a few shining examples to substantiate my claims? Ought I to tell you about all those who engage in scholarly pursuits merely in order to fill up as quickly as possible the moneybag that they have invested with the sacred aura of scientific knowledge? Shall I tell you of those savants whom others regard as having attained the pinnacle in human perfection, but who sell their science and their knowledge for thirty pieces of silver?
- 27 I will not speak of these people. I will hold my tongue, for I have resolved not to become personal.
- 28 I will just remind you of that nice saying: “For cash you can buy them anywhere: scholars and—whores!”
- 29 Another showpiece, no less impressive, is the desire to be regarded as successful, to have a so-called “career,” and the slaves of this drive are known as “careerists.” They work, they strive, they race through life at breakneck speed—not for the sake of their fellow men and not even for their own sakes, but rather for the sake of a fiction, a hallucination. With superhuman energy, they squander their lives, violate truth and justice, and frenetically destroy their own happiness and that of others, in order to snatch at a glittering phantom born of their own overheated imaginations: glory in the eyes of others.
- 30 There have always been “careerists”; that we must concede. But in the past they represented only a drop in the bucket, whereas today they can be measured by the bushel. It is an important sign of the times that such people should exist, people who pride themselves on being skeptics, who are radical in a way that makes a simple man cringe, and who venerate, as the highest goal of their lives, a mad farce, an insubstantial ideal which radiates contempt for all rational attitudes. They laugh at the simple faith of the unsophisticated, and meanwhile kneel in the dust before the idolized abomination created by their own diseased imagination.
- 31 Ominous indeed is this comet which is lighting for our dying century its path into the grave.

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32 There, we have just plucked three venomous blossoms for our little nosegay. Now let us turn our attention to a few other, more innocent “flowers of the grass” which the little educated lambkins like to nibble on.

33 I suggest that we drop in on a group of educated people at suppertime and listen to their interesting conversation.

34 The educated housewife or her spouse, the master of the house, plans to entertain this evening’s guests with talk about the theater, a concert, and all sorts of aesthetic and artistic affairs, with a bit of popular science thrown in for good measure. And of course a scrap or two of politics should also liven up the party.

35 So everyone rattles away in the most amiable fashion about the aforementioned topics. They express moderate praise or mild censure concerning a current theatrical presentation, as well as about yesterday’s concert. They get a little more stirred up about the exhibit at the art gallery, but are careful not to voice any extreme opinions that might conceivably be contradicted by one of the others. With an indulgent smile they recall the rather caustic review in the papers, and laugh just enough but not too much about a painting that has been damned by public opinion, with their hands in their pockets at the same time to show that they have their own independent views on the matter. Then they all have a swig or two of wine and move on to politics. Naturally they cannot neglect to mention the horrible things going on in Armenia. In well-chosen, polite phrases they express their view that it is a little strange of the Turkish sultan to torment the poor Armenians so. One guest tells another about the latest news bulletins, which he has just read in the papers; his partner politely plays along, saying that he really has not heard anything about the matter yet and that he is extremely interested in the fate of the good Armenians. Next someone brings up the subject of X-rays, and then it’s time to go home. Everyone was absolutely enraptured by the evening, and they all swear to high heaven that they found the conversation exceedingly lively and witty.

36 If we add these blossoms to our nosegay, we have a picture of the whole of educated society and its spheres of interest.

37 So, when we turned to people whom we expected to exhibit some depth, behold, they were all drowning in the waters of shallowness. Is it not a sad thing to see people with academic training, who at

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matriculation swore a noble oath to dedicate their lives to science and truth, ending up in this swamp?

38 As for us, will we too end by succumbing to these same treacherous shallows of banality? Will we, like these others, one day merit the reproach that we buried the precious talent<sup>9</sup> entrusted to us? Do we not have a sacred duty to guard the youthful germ-seed of awakening knowledge from the death-dealing frost of indifference?

39 We must ask questions, we must search for truth, we must struggle to attain knowledge, we cannot do otherwise. Those numbskulls who are too lazy to open their eyes and see, and who play dead whenever they have the good fortune to come face to face with a problem, are pretty pathetic specimens. Unfortunately educated people know how to behave like mealworms just like everyone else.

40 But what is the reason for the unfathomable apathy displayed by educated people today? Actually there are a number of causes. First, there are the hordes of inane books which are devoured with such ecstasy and keep minds busy with other matters. Second, there is the universal *modus vivendi* of our age, in which one studies in order to earn a good living later on, and concentrates on one's own specialty. Third, there is the dogma that science actually explains some things. And fourth, there is the wholesale indifference, where they don't give a damn about what or how or why they are studying.

41 There has never been an antidote to indifference, and as the saying goes, "the gods themselves cannot defeat stupidity." We have no choice but to rise above it.

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42 When a nonscientist asks us about the results of the exact sciences, as a rule we talk—if the field is physics—about the laws of gravitation, and about wave and ether theory;<sup>10</sup> in the field of chemistry about atomic and molecular theory; in zoology and botany about equivocal generation,<sup>11</sup> heredity and natural selection; in physiol-

<sup>9</sup> "Talent" as in the Gospel parable, Matthew 25:14-28.

<sup>10</sup> In late 19th-century physics, ether (German *Aether*) was a hypothetical medium for transmitting waves of light and heat, filling all unoccupied space. Einstein's introduction of the special theory of relativity in 1905 eliminated the need for the hypothesis.

<sup>11</sup> Equivocal generation involves the theory that organic life can spring from inorganic sources.

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ogy about mechanism and vitalism. If a scientist is honest, he concludes his remarks with a shrug of the shoulders. But as a rule scientists do not do this, for it looks better to pose as an oracle spouting dogmas. It's more impressive.

43 But if we ask ourselves, in all earnestness, whether things really are as we scientists have represented them or whether they simply look that way, we see quite a different picture. One system, one theory after the other starts to waver. Many remain with blurred contours, whereas others collapse altogether. For example, let's take a look at the theory of ether, based on the theory of light, heat, and electricity. Our question is: Is there really such a thing as an ether, do we have proofs of its existence? There are no conclusive proofs, nobody has ever perceived the ether, in any way, shape, or form, by using his normal five senses. Thus the most obvious conclusion is: There is no such thing as an ether. Yet its existence is a necessary postulate of reason. How are we to conceive and imagine motion, that is, expressions of force, divorced from a body? How can vibrations occur in the absence of a body to do the vibrating? How can light be conducted through an absolute vacuum? How can an electrical spark travel from place to place without a conductor? And yet all these phenomena do take place. Light travels immeasurable distances through the great vacuum between the stars to get here, and lightning streaks out of the clouds to the earth. Thus there must be a body, a conductor, to transmit these manifestations of energy. But this body is not perceptible to our senses, is not subjective or objective in any way. It is completely immaterial and yet has material properties perceptible to our senses. Thus there is a collision between reality and reason. Doesn't this collision represent a grave violation of the completely materialistic and skeptical attitude of modern science? Dare we call this an "explanation," this thing that runs counter to all common sense?

44 Scientists do not like to talk about the ether, for it is awkward to have to deal with properties and forces that do not appear to be linked to a body. If we expand the implications of this dilemma, we see that it is an absolute requirement of reason that unless we assume the existence of an ether, we must conclude that the existence of light is also illusory. But if an ether does exist, then reason in turn requires that light has the characteristics of an imperceptible body, a body that is in the fullest sense of the word metaphysical, that is immaterial.

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- 45 But where does this simple mental exercise lead us? The most elementary train of reasoning has suddenly transported us from the realm of the most concrete phenomena, into a realm where we must confront the most despised word in the field of applied science, namely “metaphysical.” Is it really the spirit of exact science that has directed us onto this path? It must be, for the result we have arrived at is the obvious conclusion we must draw from the facts.
- 46 Properties without a body to possess them may find themselves in a truly tragicomical situation. So does a body that possesses an impossible property. The body in question is matter itself. As we all know, it is an innate property of all bodies to exert a mutual attraction. This phenomenon is known as universal gravitation. An attempt to account for the attraction leads us into the most ominous circular arguments. For the concluding argument is always the same: Bodies attract each other—because it is a property of bodies to do so. How are we to picture this attraction? The fact that it takes place is beyond question; but how, by what avenue? *How* can this bodily property manifest itself in the body? A force is exerted that is transmitted from one body to another. Thus it must follow a certain route in order to arrive at the other body. But how is it transmitted? As we have already seen, a force without a conductor is an absurdity. Thus to get from *A* to *B*, the force must find a carrier or conductor. Does the ether obligingly perform this function? In this case the force would move from one atom of the ether to another. But this would simply mean that for the time being the property of the body is transmitted to the atoms of the ether. But if the atoms possessed this property, they would attract each other, and a concentric conglomerate of ether would form around *A* and *B*, and then the transmission of force from *A* to *B* would come to a halt. Or are we to describe the ether as inert or neutral with respect to the force of gravitation? This would be a completely transcendent explanation—i.e., it would go far beyond our conceptual powers. For how can we imagine a property transmitted by a body that is wholly neutral in relation to this property? The very definition is self-contradictory. It is absolutely impossible for a conductor—supposing that it is to function as a conductor in the first place—to assume the property in question for the time being, without assuming its characteristic manifestations, i.e., in effect without assuming the property at all. For the conductor would have

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to be constructed in such a way that it assumes and transmits a property without taking over the property as such. But this notion is so baffling that we have finally returned to a metaphysical hypothesis. For it would be too flimsy to explain one hypothesis in terms of another.<sup>12</sup>

47 And again, what is the relation between the problem of mutual attraction and the law of the conservation of energy? Probably no law of nature has ever received such repeated and universal confirmation. We are virtually *flooded* with proofs which stream toward us from the realms of both organic and inorganic nature. Without this law all the theories and experiments of the physical sciences would be impossible. The law of the conservation of energy tells us that a certain quantity of energy remains constant under all circumstances, i.e., that for every force there exists an equivalent force whose decrease is proportional to the increase of the first force. If we look at any energy source, for example, an electrical plant that supplies such-and-such a quantity of energy per day, where does the energy come from and what is its equivalent? Its equivalent is found in the kinetic energy of the waterfall whose power we tap with turbine engines. But where is the energy equivalent of the waterfall? It resides in the potential derived from its position—i.e., in the fact that the water falls from a higher to a lower place. The water derives the potential energy of its position from the heat of the sun, which has heated it to the evaporation point and thus elevated it to its present location.

48 It will not be necessary to elaborate further on this example. The meaning of the law must, I believe, be clear to everyone.

49 Now let us apply this law to our problems of universal gravitation. What is the energy equivalent of gravitational force? For it must have an energy equivalent if we are to continue to regard the law of the conservation of energy as universally valid.

50 Gravitational attraction never ceases, for every body continually exerts gravitational force, applying unvarying pressure to its place of rest. Thus gravitational force by no means ceases when the body is at rest. The attraction does not become latent in a state of rest, but is manifested as a constant degree of gravitational force. But where does the body get this energy? We must assume that it gets

<sup>12</sup> Deleted: Moreover, we have reached the border of something that simply leaves science behind.

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it from inside itself. In this case it possesses, as a part of its substance, a force equivalent to gravitational force. Thus according to the rules, certain changes must take place in the body that cause the force to develop. These changes must necessarily be material if they are to result in the production of a force that can be materially demonstrated. But material changes are subjectively or objectively perceptible by our senses, and thus the energy equivalent of gravitational attraction must be verifiable. However, in reality we cannot verify any force equivalent to gravitational force. No changes take place either inside or outside the body, which remains unaltered year in, year out, always maintaining a constant level of gravitational force. We must rest content with this circular argument: Matter exerts gravitational force because it is a property of matter to exert gravitational force. Once again we confront a collision between reason and reality. Reason demands an equivalent force, reality has none.

- 51 It would be a gross error to cite this finding as an argument invalidating the law of the conservation of energy. For if we look at the situation more closely, we see that we do not need to apply this law to universal gravitation, insofar as universal gravitation represents its point of departure. For the law merely expresses the constancy of a certain quantity of energy, and we are looking at that quantity right now. Universal gravitation represents that same specific quantity of energy whose constancy and modifications are defined by the law. The energy equivalent, which we might desire to define in terms of a higher spatial concept, is not available to us; it lies in the absolute.
- 52 Now let us turn to the atomic and molecular theory that is the basis of the system of modern chemistry. I trust that my gracious audience will spare me the labor of employing many words and arguments to elucidate the contradiction that exists, in the concrete, between reality and the postulate underlying the system. I will merely draw a quick sketch of the collision between the logical consequences of the system and the actual state of affairs. This problem, too, is of subsidiary importance, as what we see here is not a discord between reality and the claim of reason, but merely the collision between reality and a system that is not in absolute accord with reason.
- 53 We imagine matter to be composed of atoms. The atom is, by definition, a body that cannot be subdivided further, that is, a body

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without extension and thus a mathematical point. Here we see a patent contradiction: Matter has extension, and thus it can never be composed of parts without extension.

54 A far more important problem, and one of more general interest, is the province of the biological sciences, zoology, botany, and physiology; and we should include psychology as well. I am referring to the question of the origin of life.

55 It seems best if, in our critical examination of this question, we strike out on the same path which the problem itself took in the course of its evolution. Twenty or thirty years ago, the debate over the original creation threw the entire scientific world into an uproar. A heated battle raged, and rages still. The flames were not extinguished with the final refutation of Dr. Bastian.<sup>13</sup> The embers are still glowing beneath the ashes, and are flaring up again these days in the struggle between mechanism and vitalism. The question has not changed. It is still the same old question, only now it is cast in far more general and dangerous terms. What is involved here is not an insoluble contradiction between reality and the claim of reason, but rather the most violent collision between two claims, both of which are consistent with reason. At stake is the “to be or not to be” of the modern, materialist-skeptical view of nature.

56 If we trace back to its beginnings the course of the evolution of organic life, we arrive at the first cell, rocked by the warm waves of the primordial sea and dimly sensing an unknown world to come. The cell is there, and with the cell there is life. This is a brutal, incontrovertible fact. But what existed before the cell, when the hot vapors had not yet condensed around the edges of the glowing, molten ball of the earth? What was there *before*? Has organic life been there from the beginning, as matter is said to have always existed? But then how could it have survived amid the flaming chaos, the white-hot vapors of iron and platinum? Or is life perhaps a function of matter? If so, the original creation was guaranteed from the outset. Matter would have had a free hand to produce whatever forms struck its fancy. But it is a fact, verified by a hundred thousand cases, that organic beings never develop out of inorganic matter, but only through contact with life. If ever a law was absolute, then it is this, that *omne vivum ex vivo*. Practical reason (empiricism)

<sup>13</sup> Henry Charlton Bastian (1837-1914), British neurologist, was an advocate of the theory of spontaneous generation. See his *The Beginnings of Life* (London, 1872).



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requires that never, under any circumstances, shall a capricious, random occurrence intervene in that drama of nature which unfolds according to eternal laws. Yet on the other hand, pure reason (logic) requires that the existence of an organic being presupposes contact with life. Which claim should we consider justified? On the one hand, no one has ever observed a sudden arbitrary disruption of the lawful course of phenomena; on the other hand, it is equally correct that no one has yet verified a breach in the continuity of all phenomena. We see that in both cases the grounds for the claim are the same rational ones. Which claim outweighs the other? The claim of logic demands something that empiricism, on the same grounds, must categorically deny.

57 Let us take a critical look at these claims. What is the basis of the claim of empiricism? It is based on the fact that no analogous case has been observed in the past. What is the basis of the claim of logic? The fact that many thousands of such cases have been observed in the past. The “empirical” proof is negative, the “logical” positive. The scale tips in favor of the claim of logic. The results: The creation of the first cell must have come about through contact with preexistent life. For reasons already enumerated, it is impossible that this preexistent life was linked to matter, and thus it must have existed independently of matter, i.e., immaterially. Isn't this strange? The critical examination of rational scientific claims leads us into an immaterial or metaphysical realm.

58 It will not be necessary to engage in a critical examination of vitalism, for in the foregoing excursus we have already discussed the principle involved, citing the example of equivocal generation. My audience is quite capable of drawing the conclusions with regard to vitalism.

59 Now let us turn back to our nonscientist friend, the one to whom, a short while ago, we recited the results of science in such an authoritative tone. What does he have to say about all this? Won't he consider it strange and presumptuous on our part if we dare to speak about scientific “results”? Indeed, it would almost seem that there are no such things as results. Science has not actually explained anything. And if science thinks it has explained something, it has done so with a hypothesis. Whenever we look for the true “reason why,” we reach the great nothingness, a realm of the vaguest hypotheses. Our wisp of intelligence simply ceases to function at the point where the true explanation begins. We have no

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choice but to confirm the operation of causality in the realm of concrete phenomena, but can we explain it? Never. In view of all this, isn't it rather foolish for people to get so terribly worked up over Darwin's theory of the origin of species, when this theory expresses nothing substantial? The "Why?" lingers in the background; it is and remains inexplicable.

60 Our friend the nonscientist will go away shaking his head, thinking his own thoughts about the famous "enlightenment" shed by science.

61 But what do we have to say about the matter? Can we wrest nothing at all from universal nothingness? Or is there after all a possibility that what seems to us impossible may turn out to be possible? Does that Ariadne's thread which has led us this far really end abruptly in the darkness, or does it perhaps continue, leading us out of the night and into the light?

62 We imagine that we have arrived at the end. But in fact we are only at the beginning. We think that the gate is locked, when we have the key. Science supplies us the raw material; why don't we go on building? We have the basic premises; why do we resist drawing the conclusion?

63 We have seen that the ether, with its transcendental properties, constitutes an essential means of explaining certain physical phenomena, just as a preexistent vital principle is necessary to explain the world of organic phenomena. Let us enter both into our scientific computation under the designation *X*. We have positive knowledge of a limited number of properties of both these phenomena. Our natural inclination is to regard these properties as the only properties that they truly possess. But are we right? The most recent events in the world of science teach us that we have no choice but to adopt a passive attitude and to simply wait and see what more nature will choose to reveal to us. Doesn't Roentgen's discovery clearly demonstrate that the ether possesses other properties in addition to those that were already known to us?<sup>14</sup> An even more striking example of the changes in human knowledge is the triumphal entry of hypnotism into the domain of German science. After a century of struggle, public attention has finally been drawn to this new aspect of the vital principle. Such phenom-

<sup>14</sup> W. C. Roentgen (1845-1923) discovered X-rays in 1895, at Würzburg University, one year before the composition of this Zofingia lecture.

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ena surely ought to prevent us from jumping to hasty conclusions, and from claiming that now all aspects of life have been fully explored. The position of contemporary skeptical materialist opinion constitutes, simply, intellectual death. This attitude actually prohibits us from overstepping narrow boundaries. It condemns us to go on gathering data for storehouses that have long been filled to the brim. We improve our microscopes, and every day all they do is to reveal to us new and greater complexities. We improve our telescopes, and all they do is to show us new worlds and systems. The riddle remains, and the only change is that it grows ever more complex. We behold the infinity of the world in the microcosm, we behold it in the macrocosm. Where does it all end?

64 Why do we long to exhaust the ocean of infinity when we do not yet even know the banks of the pond where our materialist-minded savants are croaking away like frogs?

65 We just stated that we have admitted two metaphysical principles into the realm of material nature. The physical phenomena have been studied and threshed out down to the last detail. Metaphysical phenomena are virtually a closed book. Surely it would be valuable to inquire into properties other than those with which we have long been familiar. Our critique of the two problems more or less compels us to acknowledge their existence. An immaterial phenomenon that manifests itself only materially: Is that not an irrational claim? Is it not in fact sheer nonsense?

66 Can we imagine a body without properties? I think not. At least I would like to meet a man who was capable of doing that. Thus it is impossible for any such thing to exist. Can we conceive of a material body without material properties? This is impossible; the very idea is a contradiction in terms. But can we conceive of an immaterial body without immaterial properties? Yes indeed, for nowadays virtually the entire scientific world is doing just that. But we do not want to go along with the crowd. What we want is to allow the immaterial to retain its immaterial properties.

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