

INTRODUCTION TO THE OUTLINE OF A
SYSTEM OF THE PHILOSOPHY OF
NATURE, OR, ON THE CONCEPT OF
SPECULATIVE PHYSICS AND THE
INTERNAL ORGANIZATION OF A
SYSTEM OF THIS SCIENCE (1799)

[271]

§.1.

What we call Philosophy of Nature is a Necessary Science
in the System of Knowledge.

The intelligence is productive in two modes: either blindly and unconsciously, or freely and consciously; it is unconsciously productive in external intuition, consciously in the creation of an ideal world.

Philosophy removes this distinction by assuming the unconscious activity to be originally identical with, and, as it were, sprung from the same root as the conscious. This identity is *directly* proved in the case of an activity at once clearly conscious and unconscious, which manifests itself in the productions of *genius*; *indirectly, outside* of consciousness, in the products of *Nature*, so far as in all of them the most complete fusion of the ideal and the real is perceived.

Since philosophy assumes the unconscious, or as it may likewise be termed, the real activity to be identical with the conscious or ideal, its tendency will be to bring back everywhere the real to the ideal—a process which gives rise to what is called transcendental philosophy. The regularity displayed in all the movements of Nature—for example, the sublime geometry which is exercised in the motions of the heavenly bodies—is not explained by saying that Nature is the most perfect geometry. Rather conversely, [272] it is explained by saying that the most perfect geometry is the productive power in Nature; a mode of explanation whereby the real itself is transported into the ideal world, and those

motions are changed into intuitions which take place only in ourselves, and to which nothing outside of us corresponds. Again, the fact that Nature, wherever it is left to itself, in every transition from a fluid to a solid state, produces of its own accord, as it were, regular forms (a regularity which, in the higher species of crystallization, namely the organic, seems even to become purposefulness); or the fact that in the animal kingdom (that product of the blind forces of Nature) we see actions arise which are equal in regularity to those that take place with consciousness, and even external works of art, perfect in their kind—all of this is explained in our view by saying that it is an unconscious productivity in its origin akin to the conscious, whose mere reflection we see in Nature, and which from the standpoint of the natural view must appear as one and the same blind drive that exerts its influence from crystallization upward to the highest point of organic formation (in which, on one side, through the technical drive, it returns again to mere crystallization) only acting on different planes.

According to this view, since Nature is only the visible organism of our understanding, Nature *can* produce nothing but what shows regularity and purpose, and Nature is *compelled* to produce it. But if Nature *can* produce only the regular, and produces it from necessity, it follows that the origin of such regular and purposeful products must again be capable of being proved to be necessary in the relation of its forces, in Nature thought as independent and real—it follows *that therefore, conversely, the ideal must arise out of the real and admit of explanation from it.*

Now if it is the task of transcendental philosophy to subordinate the real to the ideal, it is, on the other hand, the task of the philosophy of nature to explain the ideal by the real. The two sciences are therefore but one science, differentiated only in the opposite orientation of their tasks. Moreover, as the [273] two directions are not only equally possible, but equally necessary, the same necessity attaches to both in the system of knowledge.

§.2.

Scientific Character of the Philosophy of Nature.

Philosophy of nature, as the opposite of transcendental philosophy, is distinguished from the latter chiefly by the fact that it posits Nature (not, indeed, insofar as it is a product, but insofar as it is at once productive and product) as the self-existent; therefore it can most concisely be designated the *Spinozism of physics*. It follows naturally from this that there is no place in this science for idealistic methods of explanation, such as transcendental philosophy is fitted to supply, since for it Nature is nothing more than the organ of self-consciousness, and everything in Nature is necessary merely because it is only through the medium of such a Nature that self-consciousness can take place. This mode of

explanation, however, is as meaningless for physics (and for our science which occupies the same standpoint) as were the old teleological modes of explanation, and the introduction of a universal reference to final causes into the science of nature, which was adulterated as a result. For every idealistic mode of explanation, dragged out of its own proper sphere and applied to the explanation of Nature, degenerates into the most adventurous nonsense, examples of which are well-known. The first maxim of all true natural science, to explain everything by the forces of Nature, is therefore accepted in its widest extent in our science, and even extended to that region at the limit of which all interpretation of Nature has until now been accustomed to stop short: for example, to those organic phenomena which seem to presuppose an analogy with reason. For, granted that there really is something which presupposes such analogy in the actions of animals, nothing further would follow on the principle of realism than that what we call "reason" is a mere [274] play of higher and necessarily unknown natural forces. For, inasmuch as all thinking is at last reducible to a producing and reproducing, there is nothing impossible in the thought that the same activity by which Nature reproduces itself anew in each successive phase, is reproductive in thought through the medium of the organism (very much in the same manner in which, through the action and play of light, Nature, which exists independently of it, is really created *immaterially*, and as it were for a second time), in which case it is natural that what forms the limit of our intuitive faculty no longer falls within the sphere of our intuition itself.

§.3.

Philosophy of Nature is Speculative Physics.

Our science, as far as we have gone, is thoroughly and completely realistic; it is therefore nothing other than physics, it is only *speculative* physics. In its tendency it is exactly what the systems of the ancient physicists were, and what, in more recent times, the system of the restorer of Epicurean philosophy is, i.e., *Lesage's* mechanical physics, by which the speculative spirit in physics, after a long scientific sleep, has again for the first time been awakened. It cannot be shown in detail here (for the proof itself falls within the sphere of our science) that on the mechanical or atomistic basis that has been adopted by Lesage and his most successful predecessors, the idea of a speculative physics cannot be realized. For, inasmuch as the first problem of this science, that of inquiring into the *absolute* cause of motion (without which Nature is not in itself a finished whole), is absolutely incapable of a mechanical solution. Because mechanically motion results only from motion to infinity, there remains for the real construction of speculative physics only one way open, the dynamic, with the presupposition that motion arises not only from motion, but

even from rest; we suppose, therefore, that there is motion in the rest of Nature, [275] and that all mechanical motion is the merely secondary and derivative motion of that which is solely primitive and original, and which wells forth from the very first factors in the construction of a Nature overall (the fundamental forces).

In making clear the points of difference between our undertaking and all those of a similar nature that have hitherto been attempted, we have at the same time shown the difference between speculative physics and so-called empirical physics; a difference which may principally be reduced to the fact that the former occupies itself solely and entirely with the original causes of motion in Nature, that is, solely with the dynamical phenomena; the latter on the contrary, inasmuch as it never reaches a final source of motion in Nature, deals only with the secondary motions, and even with the original ones only as mechanical (and therefore likewise capable of mathematical construction). The former, in fact, aims generally at the inner clockwork and what is *nonobjective* in Nature; the latter, on the contrary, only at the *surface* of Nature, and what is *objective* and, so to speak, *outside* in it.

§.4.

On the Possibility of Speculative Physics.

Insofar as our inquiry is directed not so much upon the phenomena of Nature as upon their final grounds, and our business is not so much to deduce the latter from the former as the former from the latter, our task is simply this: to erect a science of Nature in the strictest sense of the term; and in order to find out whether speculative physics is possible, we must know what belongs to the possibility of a doctrine of Nature viewed as science.

(a) The idea of knowledge is here taken in its strictest sense, and so it is easy to see that, in this use of the term, we can be said *to know* objects only when they are such that we see the principles of their possibility, for without this insight my whole knowledge of an object, e.g., of a machine [276] with whose construction I am unacquainted, is a mere seeing, that is, a mere conviction of its existence, whereas the inventor of the machine has the most perfect knowledge of it, because he is, as it were, the soul of the work, and because it preexisted in his head before he exhibited it as a reality.

Now, it would certainly be impossible to get a glimpse of the internal construction of Nature if an invasion of Nature were not possible through freedom. It is true that Nature acts openly and freely; its acts however are never isolated, but performed under the concurrence of a host of causes which must first be excluded if we are to obtain a pure result. Nature must therefore be compelled to act under certain definite conditions, which either do not exist in it at

all, or else exist only as modified by others.—Such an invasion of Nature we call an experiment. Every experiment is a question put to Nature, to which it is compelled to give a reply. But every question contains an implicit *a priori* judgment; every experiment that is an experiment, is a prophecy; experimenting itself is a production of phenomena. The first step toward science, therefore, at least in the domain of physics, is taken when we ourselves begin to produce the objects of that science.

(b) We *know* only the self-produced; knowing, therefore, in the *strictest* sense of the term, is a *pure* knowing *a priori*. Construction by means of experiment is, after all, not an absolute self-production of the phenomena. There is no question that much in the science of Nature may be known comparatively *a priori*; as, for example, in the theory of the phenomena of electricity, magnetism, and even light. There is such a simple law recurring in every phenomenon that the results of every experiment may be told beforehand; here my knowing follows immediately from a known law without the intervention of any particular experience. But whence then does the law itself come to me? We suggest that all phenomena are correlated in one absolute and *necessary* law, from which they can all be deduced; in short, that [277] in natural science all that we know, we know absolutely *a priori*. Now, that experimentation never leads to such a knowing is plainly manifest from the fact that it can never get beyond the forces of Nature, of which it makes use as means.

Since the final *causes* of natural phenomena are themselves not phenomenal, we must either give up all attempt ever to arrive at a knowledge of them, or else we must altogether put them into Nature, endow Nature with them. However, that which we put into Nature has no other value than that of a presupposition (hypothesis), and the science founded upon it must be equally as hypothetical as the principle itself. It would be possible to avoid this only in one case, i.e., if that presupposition itself were involuntary, and as necessary as Nature itself. Assuming, for example, what must be assumed, that the sum of phenomena is not a mere world, but of necessity a Nature (that is, that this whole is not merely a product, but at the same time productive), it follows that in this whole we can never arrive at absolute identity, because this would bring about an absolute transition of Nature as productive into Nature as product, that is, it would produce absolute rest. Such a wavering of Nature, therefore, between productivity and product, will necessarily appear as a universal duplicity of principles, whereby Nature is maintained in continual activity, and prevented from exhausting itself in its product; and universal duality as the principle of explanation of Nature will be as necessary as the idea of Nature itself.

This absolute hypothesis must bear its necessity within itself, but it must, besides this, be brought to an empirical test; *for, inasmuch as all the phenomena of Nature cannot be deduced from this hypothesis as long as there is in the whole system*

of Nature a single phenomenon which is not necessary according to that principle, or which contradicts it, the hypothesis is thereby at once shown to be false, and from that moment ceases to have validity as a hypothesis.

[278] By this deduction of all natural phenomena from an absolute hypothesis, our knowing is changed into a construction of Nature itself, that is, into a science of Nature *a priori*. If, therefore, such deduction itself is possible, a thing which can be proved only by the deed, then too a doctrine of Nature is possible as a science of Nature; a system of purely speculative physics is possible, which was the point to be proved.

Note. There would be no necessity for this remark if the confusion that still prevails in regard to ideas perspicuous enough in themselves did not render some explanation with regard to them requisite.

The assertion that natural science must be able to deduce all its principles *a priori* is in a sense understood to mean that natural science must dispense with all experience, and, without any intervention of experience, be able to spin all its principles out of itself; an affirmation so absurd that the very objections to it deserve pity.—*Not only do we know this or that through experience, but we originally know nothing at all except through experience, and by means of experience,* and in this sense the whole of our knowledge consists of the judgments of experience. These judgments become *a priori* principles when we become conscious of them as necessary, and thus every judgment, whatever its content may be, may be raised to that dignity, insofar as the distinction between *a priori* and *a posteriori* judgments is not at all, as many people may have imagined, one originally cleaving to the judgments themselves, but is a distinction made solely *with respect to our knowing*, and the *kind* of our knowledge of these judgments, so that every judgment which is merely historical for me—i.e., a judgment of experience—becomes, notwithstanding, an *a priori* principle as soon as I arrive, whether directly or indirectly, at insight into its internal necessity. Now, however, it must in all cases be possible to recognize every natural phenomenon as absolutely necessary; for, if there is no chance in Nature at all, then likewise no original phenomenon of Nature can be fortuitous; on the contrary, for the very reason that Nature is a system, there must be [279] a necessary connection, in some principle embracing the whole of Nature, for everything that happens or comes to pass in it.—Insight into this internal necessity of all natural phenomena becomes, of course, still more complete, as soon as we reflect that there is no real system which is not, at the same time, an organic whole. For if, in an organic whole, all things mutually bear and support each other, then this organization must have existed as a whole previous to its parts; the whole could not have arisen from the parts, but the parts must have arisen out of the whole. It is *not, therefore, that we know Nature as a priori, but Nature is a priori*; that is, everything individual in it is predetermined by the whole or by the idea of a

Nature generally. But if Nature *is a priori*, then it must be possible to *recognize it as something that is a priori*, and this is really the meaning of our affirmation.

Such a science, like every other, does not deal with the hypothetical or the merely probable, but depends upon the evident and the certain. Now, we may indeed be quite certain that every natural phenomenon, through whatever number of intermediate links, stands in connection with the last conditions of Nature; the intermediate links themselves, however, may be unknown to us, and still lying hidden in the depths of Nature. To find out these links is the work of experimental research. Speculative physics has nothing to do but to show the need of these intermediate links;* but since every new discovery throws us back upon a new ignorance, and while one knot is being loosed a new one is being tied, it is conceivable that the complete discovery of all the intermediate links in the chain of Nature, and therefore also our science itself, is an infinite task.—Nothing, however, has more impeded the infinite progress of this science than the arbitrariness of the fictions by which [280] the lack of profound insight was so long doomed to be concealed. The fragmentary nature of our knowledge becomes apparent only when we separate what is merely hypothetical from the pure outcome of science, and then set out to collect the fragments of the great whole of Nature again into a system. It is, therefore, conceivable that *speculative* physics (the soul of true experimentation) has, throughout all time, been the mother of all great discoveries in Nature.

§.5.

On a System of Speculative Physics in General.

Up to this point the idea of speculative physics has been deduced and developed; it is another business to show how this idea must be realized and actually carried out. The author, for this purpose, would at once refer to his *Outline of a System of the Philosophy of Nature*, if he had no reason to suspect that many even of those who might consider that *Outline* worthy of their attention, would come to it with certain preconceived ideas, which he has not presupposed, and which he does not desire to have presupposed by them. The causes which may render an insight into the tendency of that *Outline* difficult, are (exclusive of defects in presentation) mainly the following:

1) That many persons, perhaps misled by the phrase “philosophy of nature,” expect to find transcendental deductions from natural phenomena, of the

*Thus, for example, it becomes very clear through the whole course of our inquiry, that, in order to render the dynamic organization of the Universe evident in all its parts, we still lack that *central phenomenon* of which Bacon already speaks, which certainly lies in Nature but has not yet been extracted from it by experiment. (Original note.—Trans.)

sort that exist elsewhere in various fragments, and will regard natural philosophy generally as a part of transcendental philosophy; whereas it forms a science altogether peculiar, altogether different from, and independent of, every other.

2) That the notions of dynamical physics popularized until now are very different from, and partially at variance with, those which the author lays down. I do not speak of the modes of representation which several persons, whose business is really merely experiment, have made up in this connection; for example, where they suppose it to be a dynamical explanation [281] when they reject a galvanic fluid, and accept instead certain vibrations in the metals; for these persons, as soon as they observe that they have understood nothing of the matter, will revert of their own accord to their previous representations, which were made for them. I speak of the modes of representation which have been put into philosophic heads by Kant, and which may be mainly reduced to this: that we see in matter nothing but the occupation of space in definite degrees, and in all variety of matter, therefore, only mere difference of occupation of space (i.e., density), in all dynamic (qualitative) changes only mere changes in the relation of the repulsive and attractive forces. Now, according to this mode of representation, all the phenomena of Nature are seen only on their lowest level, and the dynamical physics of these philosophers begin precisely at the point where they ought properly to leave off. It is indeed certain that the last result of every dynamical process is a changed degree of occupation of space, that is, a changed density; now, since the dynamical process of Nature is one, and the individual dynamical processes are only fragments of the one fundamental process, even magnetic and electrical phenomena, viewed from this standpoint, will not be actions of particular materials, but changes in *the constitution of matter itself*; and as this depends upon the mutual action of the fundamental forces, finally, will be changes in the relation of the fundamental forces themselves. We do not indeed deny that these phenomena at the extreme limit of their manifestation are changes in the relation of the principles themselves; we only deny that these changes are *nothing more*. On the contrary, we are convinced that this so-called dynamical principle is too superficial and defective a basis of explanation for all of Nature's phenomena in order to reach the real depth and manifoldness of natural phenomena, since by means of it, in fact, no qualitative change of matter *as* such is constructible (for change of density is only the external phenomenon of a higher change). To adduce proof of this assertion is not incumbent upon us, until, from [282] the opposite side, that principle of explanation is shown by actual fact to exhaust Nature, and the great chasm is filled up between that kind of dynamical philosophy and the empirical attainments of physics (for example, in regard to the very different kinds of effects exhibited by simple substances, a thing which, let us say at once, we consider to be impossible).

We may therefore be permitted, in place of the dynamic mode of representation prevailing until now, to put our own without further ado, a gesture which will no doubt clearly show how the latter differs from the former, and by which of the two the doctrine of Nature may most certainly be raised to a science of Nature.

§.6.

Internal Organization of the System of Speculative Physics.

I.

An inquiry into the *principle* of speculative physics must be preceded by inquiries into the distinction between the speculative and the empirical generally. This distinction depends mainly upon our conviction that between empiricism and theory there is such a complete opposition that there can be no third thing in which the two may be united; that, therefore, the idea of “experimental science” is a mongrel idea that implies no consistent thought, or rather, is an idea which cannot be thought at all. What is pure empiricism is not science, and conversely, what is science is not empiricism. This is not said for the purpose of at all deprecating empiricism, but is meant to exhibit it in its true and proper light. Pure empiricism, be its object what it may, is history (the absolute opposite of theory), and conversely, history alone is empiricism.*

[283] Physics, as empiricism, is nothing but a collection of facts, of accounts of what has been observed, what has happened under natural or artificial circumstances. In what we at present call physics, empiricism and science run riot together, and for that very reason they are neither one thing nor another. Our aim, in view of this object, is to separate science and empiricism as soul and body, and by admitting nothing into science which is not susceptible of an *a priori* construction, to strip empiricism of all theory, and restore it to its original nakedness.

The opposition between empiricism and science rests therefore upon this: that the former regards its object in *being*, as something already prepared and accomplished; science, on the other hand, views its object in *becoming*, and as something that has yet to be accomplished. As science cannot set out from anything that is a product, that is, a thing, it must set out from the unconditioned;

*If only those warm panegyrists of empiricism, who exalt it at the expense of science, did not, true to the idea of empiricism, try to palm off upon us their own judgments as empiricism, and what they have put into Nature and imposed upon objects. Though many people think they can talk about it, there is a great deal more belonging to empiricism than many imagine—to eliminate purely the product from Nature, and to render it with the same fidelity with which it has been eliminated. (Original note.—Trans.)

the first inquiry of speculative physics is that which relates to the unconditioned in natural science.

II.

As this inquiry is, in the *Outline*, deduced from the highest principles, the following may be regarded as merely an illustration of those inquiries. Inasmuch as everything of which we can say that it *is*, is of a conditioned nature, it is only *being itself* that can be the unconditioned. But seeing the individual being, as a conditioned thing, can only be thought as a particular limitation of the productive activity (the sole and ultimate substrate of all reality), *being itself* is *thought* as the same productive activity *in its unlimitedness*. For the science of nature, therefore, Nature is originally only productivity, and from this as its principle science must set out.

[284] As long as we only know the totality of objects as the sum total of all being, this totality is a mere *world*, that is, a mere product for us. It would certainly be impossible in the science of nature to rise to a higher idea than that of being if all permanence (which is thought in the idea of being) were not deceptive, and really a continuous and uniform reproduction.

Insofar as we regard the totality of objects not merely as a product, but at the same time necessarily as productive, it becomes *Nature* for us, and this *identity of the product and the productivity*, and this alone, is implied by the idea of Nature, even in the ordinary use of language. *Nature* as a mere *product* (*natura naturata*) we call Nature as *object* (with this alone all empiricism deals). *Nature as productivity* (*natura naturans*) we call *Nature as subject* (with this alone all theory deals).

As the object is never unconditioned, something absolutely nonobjective must be put into Nature; this absolutely nonobjective factor is nothing else but the original productivity of Nature. In the conventional view productivity vanishes in the product; conversely, in the philosophic view the product vanishes into the productivity.

Such an identity of the product and the productivity in the *original* conception of Nature is expressed by the ordinary view of Nature as a whole, which is at once the cause and the effect of itself, and is in its duplicity (which runs through all phenomena) again identical. Furthermore, with this idea the identity of the real and the ideal agrees, an identity which is thought in the idea of every product of Nature, and with respect to which only the nature of art can be placed in contrast. For whereas in art the idea precedes the act or the execution, in Nature idea and act are rather contemporary and one; the idea passes immediately over into the product, and cannot be separated from it.

[285] This identity is canceled by the empirical perspective, which sees in Nature only the *effect* (although on account of the continual wandering of

empiricism into the field of science, we have, even in purely empirical physics, maxims which presuppose an idea of Nature as subject; such as, for example, "Nature chooses the shortest way"; "Nature is sparing in causes and lavish in effects"); the identity is also canceled by speculation, which looks only at *cause* in Nature.

III.

We can say of Nature as object that it *is*, not of Nature as subject; for this is being or productivity itself. This absolute productivity must pass over into an empirical nature. In the idea of absolute productivity is the thought of an *ideal* infinity. The ideal infinity must become an empirical one. But empirical infinity is an infinite becoming.—Every infinite series is but the exhibition of an intellectual or ideal infinity. The original infinite series (the ideal of all infinite series) is that wherein our intellectual infinity evolves itself, i.e., time. The activity which sustains this series is the same as that which sustains our consciousness; consciousness, however, is continuous. Time, therefore, as the evolution of that activity, cannot be produced by composition. Now, as all other infinite series are only imitations of the originally infinite series, time, no infinite series can be otherwise than continuous. In the original evolution the inhibiting agent (without which the evolution would take place with infinite rapidity) is nothing but *original reflection*; the necessity of reflection upon our acting in every organic moment (continued duplicity in identity) is the secret stroke of art whereby our being receives *permanence*.—Absolute continuity, therefore, exists only for intuition, but not for [286] *reflection*. Intuition and reflection are opposed to each other. The infinite series is continuous for productive *intuition*, interrupted and composite for reflection. It is upon this contradiction between intuition and reflection that those sophisms are based, in which the possibility of all motion is contested, and which are solved at every successive step by the productive activity. For intuition, for example, the action of gravity takes place with perfect continuity; for reflection, by fits and starts. Hence all the laws of mechanics, whereby that which is properly only the object of the productive intuition becomes an object of reflection, are really only laws for reflection.—Hence those fictitious notions of mechanics, the atoms of time in which gravitation acts, the law that the moment of solicitation is infinitely small because otherwise an infinite rapidity would be produced in finite time, etc., etc. Hence, finally, the assertion that in mathematics no infinite series can really be represented as continuous, but only as advancing by fits and starts.

The whole of this inquiry into the opposition between reflection and the productivity of intuition serves only to enable us to deduce the general statement that in all productivity, and in productivity alone, is there absolute continuity; a statement of importance in the consideration of the whole of Nature.

For example, when the law that in Nature there is no leap, that there is a continuity of forms in it, etc., is confined to the original productivity of Nature, in which certainly there must be continuity, and where from the standpoint of reflection all things must appear *disconnected* and *without* continuity, placed beside each other, as it were, we must therefore admit that both parties are right. Those who assert continuity in Nature (for example, in organic Nature) are correct, no less than those who deny it, when we take into consideration the difference of their respective standpoints; and we thus at the same time come upon the distinction between dynamical and atomistic physics; for, as will soon become apparent, the two are distinguished only by the fact that the former occupies the standpoint of *intuition*, the latter that of *reflection*.

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[287]

IV.

Assuming these general principles, we shall be able, with more certainty, to reach our aim and provide an exposition of the internal organization of our system.

(a) In the idea of becoming, we think the idea of gradualness. But an absolute productivity will exhibit itself empirically as a becoming with infinite rapidity, whereby nothing real results for the intuition. (Since Nature must in reality be thought as engaged in infinite evolution, the permanence, the resting of the products of Nature (the organic ones, for instance), is not to be viewed as an absolute resting, but only as an evolution proceeding with infinitely small rapidity or with infinite tardiness. However, at this point evolution, with even finite rapidity, not to speak of infinitely small rapidity, has not been constructed.)

(b) It is not thinkable that the evolution of Nature should take place with finite rapidity, and thus become an object of intuition, without an original limitation (a being limited) of the productivity.

(c) But if Nature is absolute productivity, then the ground of this limitation cannot lie *outside* of it. Nature is originally *only* productivity; there can, therefore, be nothing determined in this productivity (all determination is negation) and so products can never be reached by it.—If products are to be reached, the productivity must pass from being undetermined to being determined, that is, it must, *as pure* productivity, be canceled. If the ground of determination of productivity lay outside of Nature, Nature would not originally be absolute productivity. Determination, that is, negation, must certainly come into Nature; but this negation viewed from a higher standpoint must again be positivity.

(d) But if the ground of this limitation lies *within Nature itself*, then Nature ceases to be *pure identity*. (Nature, in so far as it is *only* productivity, is pure identity, and there [288] is absolutely nothing in it capable of being distinguished. In order for anything to be distinguished in it, its identity must be canceled; Nature must not be identity, but duplicity.)

Nature must originally be an object to itself; this change of the *pure subject* into an *object to itself* is unthinkable without an original diremption in Nature itself.

This duplicity cannot therefore be further deduced physically; for, as the condition of all Nature generally, it is the principle of all physical explanation, and all physical explanation can only have for its aim the reduction of all the antitheses which appear in Nature to that original antithesis in the heart of Nature, *which does not, however, itself appear*.—Why is there no original phenomenon of Nature without this duplicity, if in Nature all things are not mutually subject and object to each other to infinity, and Nature even, in its origin, is not at once product and productive?—

(e) If Nature is originally duplicity, there must even be opposite tendencies in the original productivity of Nature. (The positive tendency must be opposed by another, which is, as it were, antiproduative, retarding production; not as the contradictory, but as the negative, the real opposite of the former.) It is only then that, in spite of its being limited, there is no passivity in Nature, even when that which limits it is again positive, and its original duplicity is a contest of real antithetical tendencies.

(f) In order to arrive at a product, these opposite tendencies must encounter one another. But since they are supposed *equal* (for there is no ground for supposing them unequal), wherever they meet they will annihilate each other; the product is therefore = to 0, and once more no product is reached.

This inevitable, though hitherto not very closely remarked contradiction (namely, that a product can arise only through the concurrence of opposite tendencies, while at the same time these opposite tendencies mutually annihilate each other) can be solved only in the following manner.

Absolutely no *subsistence* of a product is thinkable *without* [289] *a continual process of being reproduced*. The product must be thought *as annihilated at every step*, and *at every step reproduced anew*. We do not really see the subsisting of a product, but only the continual process of being reproduced. (It is of course quite conceivable how the series $1-1+1-1 \dots$ on to infinity is thought as equal neither to 1 nor to 0. The reason why this series is thought as = $\frac{1}{2}$ lies deeper. There is one absolute magnitude (= 1) which, though continually annihilated in this series, continually recurs, and by this recurrence produces, not itself, but the mean between itself and nothing.—Nature, as object, is that which comes to pass in such an infinite series, and is = a fraction of the original unit, to which the never canceled duplicity supplies the numerator.)

(g) If the subsistence of the product is a continual process of being reproduced, then all *persistence* also only exists in Nature as *object*; in Nature as *subject* there is only infinite *activity*. The product is originally nothing but a mere

point, a mere limit, and it is only through Nature's battling against this point that it is, so to speak, raised to a full sphere, to a product. (Suppose, for illustration, a stream; it is *pure identity*; where it meets resistance, a whirlpool is formed; this whirlpool is not an abiding thing, but something that vanishes at every moment, and every moment springs up anew.—Originally, in Nature there is nothing distinguishable; all products are, so to speak, still in solution, and invisible in the universal productivity. It is only when retarding points are given that they are thrown off and advance out of the universal identity.—At every such point the stream breaks (the productivity is annihilated), but at every step there comes a new wave which fills up the sphere).

The philosophy of nature does not have to explain the productive power of Nature; for if it does not posit this as originally in Nature it will never bring it into Nature. It has to explain the permanent. But the fact *that* anything should become permanent in Nature, can itself [290] only be explained by that contest of Nature *against all permanence*. The products would appear as mere points if Nature did not give them extension and depth by its own pressure, and the products themselves would last only an instant if Nature did not at every moment shove into them.

(h) This seeming product, which is reproduced at every step, cannot be a really infinite product; for otherwise productivity would actually be exhausted in it. In like manner it cannot be a finite product; for the force of the whole of Nature itself surges into it. It must therefore be at once infinite and finite; it must be only seemingly finite, but in infinite *development*.

The point at which this product originally enters is the universal point of inhibition in Nature, the point from which all evolution in Nature begins. But in Nature, as it is evolved, this point lies not here or there, but everywhere where there is a product.

This product is a finite one, but as the infinite productivity of Nature concentrates itself in it, it must have a drive toward infinite development.—And thus gradually, and through all the foregoing intermediate links, we have arrived at the construction of that infinite becoming, the empirical exhibition of an ideal infinity.

We behold in what is called Nature (i.e., in this collection of individual objects), not the primal product itself, but its evolution (hence the point of inhibition cannot remain *one*).—It has not yet been explained by what means *this* evolution is again absolutely inhibited (which must happen if we are to arrive at a fixed product).—

Through this product an original infinity evolves itself; this infinity can never decrease. The magnitude that evolves itself in an infinite series is still [291] infinite at every point of the line, and thus Nature will be still infinite at every point of the evolution.

There is only one original point of inhibition to productivity; but any number of points of inhibition to evolution may be thought. Every such point is marked for us by a product. Nature is still infinite at every point of the evolution, however; therefore Nature is still infinite in every product, and the germ of a universe lies in every one.*

(The question, by what means the infinite striving is retarded in the product, is still unanswered. The original inhibition in the *productivity* of Nature explains only why the evolution takes place with finite rapidity, but not why it takes place with infinitely small rapidity.)

(i) The product evolves itself to infinity. In this evolution, therefore, nothing can happen which is not already a product (synthesis) and which might not divide up into new factors, each of these again having its factors. Thus even by an analysis pursued to infinity, we could never arrive at anything in Nature which would be absolutely simple.

(k) If, however, we *suppose* the evolution to be completed (although it *never* can be completed), the evolution could not stop at anything which was a product, but only at the purely *productive*.

The question arises whether a final term—one that is no longer a substrate, but the cause of all substrate, no longer a product, but absolutely productive—we will not say “occurs,” for that is unthinkable, but can at least be proved in experience.

(l) Since it bears the character of the unconditioned, it would have to exhibit itself as something which, although itself not in space, is still the principle of all occupation of space. (See the *Outline*, p. 19.)

[292] What *occupies* space is not matter, for matter is the occupied space itself. That, therefore, which occupies space cannot be matter. Only that which is, is in space, but *being itself* is not.

It is self-evident that no positive external intuition of that which is not in space is possible. It would therefore have to be capable of being exhibited at least negatively. This happens in the following manner. That which is in space, is, as such, mechanically and chemically destructible. That which is not

*A traveler in Italy makes the remark that the whole history of the world may be demonstrated on the great obelisk at Rome—so, likewise, in every product of Nature. Every mineral body is a fragment of the annals of the Earth. But what is the Earth?—Its history is interwoven with the history of the whole of Nature, and so passes from the fossil through the whole of inorganic and organic Nature, until it culminates in the history of the universe—one chain. (Original note—Trans.)

destructible either mechanically or chemically must therefore lie beyond space. It is only the final ground of all *quality* that has anything of this nature; for although one quality may be extinguished by another, this can nevertheless only happen in a third product, C, for the formation and maintenance of which A and B (the opposite factors of C), must continue to act.

But this indestructible factor, which is thinkable only as *pure intensity*, is, as the cause of all substrate, at the same time the principle of divisibility to infinity. (A body divided to infinity still occupies space to the same degree as its smallest part.)

That, therefore, which is purely productive without being a *product* is but the ultimate ground of *quality*. But every quality is a determinate one, whereas productivity is originally indeterminate. In the qualities, therefore, productivity appears as already inhibited, and since it appears most originally in them overall, it appears in them *most originally inhibited*.

This is the point at which our mode of conception diverges from that of conventional so-called dynamical physics. Our assertion, briefly stated, is this:

If the infinite evolution of Nature were *completed* (which is impossible) it would separate out into original and simple *actants*, or, if we may so express ourselves, into simple productivities. Our assertion therefore is not that *there are* such simple *actants* in Nature, [293] but only that they are the *ideal* grounds of the explanation of quality. These *entelechie*s cannot actually be shown, they do not *exist*. We therefore do not have to explain anything more than is asserted here, namely, that such original productivities must be *thought* as the grounds of the explanation of all quality. This proof is as follows:

The affirmation that nothing which *is* in space is mechanically simple, that is, that nothing at all is mechanically simple, requires no demonstration. That, therefore, which is in reality simple, cannot be thought as in space, but must be thought as outside of space. But beyond space only *pure intensity* is thought. This idea of pure intensity is expressed by the idea of the actant. It is not the product of this action that is simple, but the *actant itself* abstracted from the product, and it must be simple in order that the product may be infinitely divisible. For although the parts are near vanishing, the intensity must still remain. And this pure intensity is what, even in infinite divisibility, sustains the substrate.

If, therefore, the assertion that affirms something simple as the basis of the explanation of quality is atomistic, then our philosophy is atomistic. But, inasmuch as it places the simple in something that is only productive without being a product, it is *dynamical atomism*.

It is clear that if we admit an absolute division of Nature into its factors, the last factor that remains over must be something that absolutely defies all division, that is, the simple. But the simple can only be thought as dynamical, and as such it is *not in space at all* (it designates only what is thought as altogether beyond occupation of space); therefore, no intuition of it is possible, except through its *product*. In like manner, no measure for it is given other than its product. To pure thought it is the mere *inception* of the product (as the point is only the origin of the line), in a word, pure *entelechy*. But that which is known, not in itself, but only in its product, is known altogether *empirically*. If, therefore, every original quality, as quality [294] (not as substrate, in which quality merely inheres), must be thought as pure intensity, pure *action*, then qualities generally are just the absolutely empirical factors in our knowledge of Nature, of which no construction is possible, and in respect to which there remains nothing for the philosophy of nature except the proof that they are the absolute limit of its construction.

The question in reference to the ground of quality posits the evolution of Nature as completed, that is, it posits something merely thought, and therefore can be answered only by an ideal ground of explanation. This question adopts the standpoint of reflection (on the product), whereas genuine dynamics always remains on the standpoint of *intuition*.—

(However, it must be at once remarked here that if the ground of the explanation of quality is conceived as an *ideal* one, the question only regards the explanations of quality, insofar as it is thought as *absolute*. There is no question of quality, for instance, insofar as it shows itself in the dynamical process. There is certainly a* ground of explanation and determination for quality, so far as it is relative; quality in that case is determined by its opposite, with which it is placed in conflict, and this antithesis is itself again determined by a higher antithesis, and so on back into infinity; so that, if this universal organization could dissolve itself, all matter would likewise sink back into dynamical inactivity, that is, into absolute absence of quality. Quality is a higher power of matter, to which the latter elevates itself by reciprocity.) It is demonstrated below that the dynamical process is a limited one for each individual sphere, because it is only through limitation that definite points of relation for the determination of quality arise. This limitation of the dynamical process, that is, the proper *determination* of quality, takes place by means of no other force than that by which the evolution is universally and absolutely limited, and this negative element in things is the only one that is indivisible, and mastered by nothing. —The [295] absolute relativity of all quality may be shown from the electric relation of bodies, inasmuch

*not merely ideal, but actually real

as the same body that is positive with one is negative with another, and conversely. But we might from now on abide by the statement (which is also laid down in the *Outline*) that *all quality is electricity*, and conversely, *the electricity of a body is also its quality* (for all difference of quality is equal to difference of electricity, and all* quality is reducible to electricity).—Everything that is sensible for us (sensible in the narrower sense of the term, as colors, taste, etc.), is doubtless sensible to us only *through* electricity, and the only *immediately* sensible factor would then be electricity,[†] a conclusion to which the universal duality of every sense leads us independently, since in Nature there is properly only one duality. In galvanism, sensibility, as a reagent, reduces all quality of bodies for which it is a reagent to an original difference. All bodies which, in a chain, at all affect the sense of taste or that of sight, be their differences ever so great, are either alkaline or acid, excite a negative or positive shock, and here they always appear as active in a higher than the *merely* chemical potency.

Quality considered as *absolute* is inconstructible, because quality generally is not anything absolute, and there is no other quality at all except that which bodies show mutually in relation to each other, and all quality is something by virtue of which the body is, so to speak, *raised above itself*.

All previous attempts at the construction of quality are reducible to two: to express qualities by *figures*, and so to assume a particular figure in Nature for each original quality; or else, [296] to express quality by *analytical formulae* (in which the forces of attraction and repulsion supply the negative and positive magnitudes). To convince oneself of the futility of the latter attempt, the shortest method is to appeal to the emptiness of the explanations to which it gives rise. Hence we limit ourselves here to the single remark that through the construction of all matter out of the two fundamental forces, different degrees of density may indeed be constructed, but certainly never different qualities *as* qualities; for although all dynamical (qualitative) changes appear, at their lowest stage, as changes of the fundamental forces, yet we see at that stage only the product of the process, not the *process itself*, and those changes are *what require explanation*, and the ground of explanation must therefore certainly be sought in something higher.—

The only possible ground of explanation for quality is an ideal one; because this ground itself presupposes something purely ideal. Whoever inquires into the final ground of quality is transported back to the starting point of Nature. But where is this starting point? And does not all quality consist in this,

*chemical

[†]Volta already asks, with reference to the affection of the senses by galvanism: "Might not the electric fluid be the immediate cause of all flavors? Might it not be the cause of sensation in all the other senses?" (Original note.—Trans.)

that matter is prevented by the general concatenation from reverting into its originality?

From the point at which reflection and intuition separate (a separation which is possible only on the hypothesis of the completed evolution), physics divides into two opposite directions, into which the two systems, the atomistic and the dynamical, have been divided.

The *dynamical* system *denies* the absolute evolution of Nature, and passes from Nature as synthesis (= Nature as subject) to Nature as evolution (= Nature as object); the *atomistic* system passes from the evolution, as the original, to Nature as synthesis; dynamics passes from the standpoint of intuition to that of reflection; atomistics from the standpoint of reflection to that of intuition.

Both directions are equally possible. If only the analysis is correct, then the synthesis must be capable of being found again through analysis, just as [297] the analysis in its turn can be found through the synthesis. But whether the analysis is correct can be tested only by the fact that we can pass from it again to the synthesis. The synthesis therefore is, and continues to be, the absolutely presupposed.

The problems of the one system turn exactly around into those of the other; that which, in atomical physics, is the cause of the *composition* of Nature is, in dynamical physics, *that which inhibits evolution*. The former explains the composition of Nature by the force of cohesion, by means of which, however, no continuity is ever introduced into it; the latter, on the contrary, explains cohesion by the continuity of evolution. (All cohesion is originally only in the productivity.)

Both systems set out from something purely ideal. Absolute synthesis is as much purely *ideal* as absolute analysis. The real occurs only in Nature as *product*; but Nature is not product, neither when thought as absolute involution or as absolute evolution; *product* is what is contained between the two extremes.

The first problem for both systems is to construct the product, i.e., that in which the opposites become real. Both reckon with purely *ideal* magnitudes so long as the product is not constructed; it is only in the *directions* in which they accomplish this that they are opposed. Both systems, as far as they have to deal with merely ideal factors, have the same value, and the one forms the test of the other.—That which is concealed in the depths of productive Nature must be reflected as product in Nature as Nature, and thus the atomistic system must be the continual reflection of the dynamical. In the *Outline*, of the two directions, that of atomistic physics has been chosen intentionally. It will contribute not a little to the understanding of our science if we here demonstrate in the *productivity* what was there shown in the *product*.

(m) *In the pure productivity of Nature absolutely nothing is distinguishable without diremption; [298] it is only productivity dualized in itself that gives the product.*

Since the absolute productivity arrives only at producing per se, not at the producing of a determinate something, the tendency of Nature, by virtue of which a product is arrived at, must be the *negative* of productivity.

In Nature, insofar as it is real, there can no more be productivity without a product than a product without productivity. Nature can only approximate to the two extremes, and it must be demonstrated *that* it approximates to both.

(α) *Pure productivity originally passes into formlessness.*

Wherever Nature loses itself in formlessness, productivity is exhausted in it. (This is what we express when we talk of a “becoming latent.”)—Conversely, wherever the form predominates, i.e., wherever the productivity is *limited*, the productivity manifests itself; it appears, not as a (representable) product, but *as* productivity, although passing over into one product, as in the phenomena of heat. (The idea of imponderables is only a *symbolic* one.)

(β) *If productivity passes into formlessness, then, objectively considered, it is the absolutely formless.*

(The boldness of the atomical system has been very imperfectly comprehended.—The idea which prevails in it, that of an absolutely formless element everywhere incapable of manifestation as determinate matter, is nothing other than the symbol of Nature approximating to productivity.—The nearer to productivity the nearer to formlessness.)

(γ) *Productivity appears as productivity only when limits are set to it.*

That which is everywhere and in everything, is, for that very reason, nowhere.—Productivity is fixed only by limitation.—*Electricity exists* only at that point at which limits are given, and it is only a poverty of conception that would look for anything else in its phenomena [299] beyond the phenomena of (limited) productivity.—The condition of *light* is an antithesis in the electric and galvanic processes, as well as in the chemical process, and even light which comes to us without our cooperation (the phenomenon of productivity exerted all around by the Sun) presupposes that antithesis.*

*According to recent *experiments*, it is at least not impossible to regard the phenomena of light and those of electricity as one, since in the prismatic spectrum the colors may at least be considered to be opposites, and the white light, which regularly falls in the middle, *can* be regarded as the point of indifference; and for reasons of *analogy* one is tempted to consider *this* construction of the phenomena of light as the real one. (Original note.—Trans.)

(δ) *It is only limited productivity that gives rise to the product.*

(The explanation of the product must begin at the origination of the fixed point at which the start is made.)—*The condition of all formation is duality.* (This is the more profound signification that lies in Kant's construction of matter from opposite forces.) Electrical phenomena are the general scheme for the construction of matter universally.

(ε) *In Nature, neither pure productivity nor pure product can ever exist.*

The former is the negation of all product, the latter the negation of all productivity. (Approximation to the former is the absolutely decomposable, to the latter the absolutely indecomposable substance of the atomists. The former cannot be thought without, at the same time, being the absolutely impossible, the latter without, at the same time, being the absolutely composable.)

Nature will therefore originally be the mean factor arising out of the two, and thus we arrive at the idea *of a productivity engaged in a transition into product, or of a product that is productive* to infinity.—We hold to the latter definition. The idea of the product (the fixed) and that of the productive (the free) are mutually opposed.—Since what we have postulated is already [300] product, it can be productive, if it is productive at all, only in a *determinate way*. But determined productivity is (active) *formation*. That third factor must therefore be *in the state of formation*.

But the product is supposed to be productive to infinity (that transition is never to take place absolutely); it will therefore be productive at every stage in a determinate way; the productivity will remain, but not the product.

(The question might arise how a transition from form to form is possible at all here, when *no* form is fixed. Still, that *momentary* forms should be reached has already been rendered possible by the fact that the evolution cannot take place with infinite rapidity, in which case, therefore, for every moment at least, the form is certainly a determinate one.) The product will appear to be gripped in *infinite metamorphosis*.

(From the standpoint of reflection, it will appear to be continually in the leap from fluid to solid, without ever reaching, however, the form sought.—Organisms that do not live in the cruder element at least live on the deep ground of the aerial sea—many pass over, by metamorphoses, from one element into another; and what does the animal, whose vital functions almost all consist in contractions, appear to be, other than such a leap?)

The metamorphosis will not possibly take place *without rule*. For it must remain within the original antithesis, and is thereby confined within limits.*

*Hence wherever the antithesis is canceled or deranged, the metamorphosis becomes irregular.—For what is even disease but metamorphosis? (Original note.—Trans.)

(This accordance with rule will express itself solely by an internal relationship of forms, a relationship which again is not thinkable without an archetype which lies at the basis of all—and which, with however manifold divergences, they nevertheless all express.)

But even with such a product we do not have that which we [301] were searching for, a product which, while productive to infinity, remains *the same*. That this product should remain the same seems unthinkable, because it is not thinkable without an absolute inhibition or cancellation of the productivity.—The product would have to be inhibited as the productivity was inhibited, for it is still productive, inhibited by diremption and the limitation resulting from it. But it must at the same time be explained how the productive product can be inhibited at each individual stage of its formation, without its ceasing to be productive, *or how, by diremption itself, the permanence of the productivity is secured*.

In this way we have brought the reader as far as the problem of the fourth section of the *Outline*, and we leave him to find in it for himself the solution, along with the corollaries which it brings up.—Meanwhile, we shall endeavor to indicate how the deduced product would necessarily appear from the standpoint of *reflection*.

The product is the synthesis wherein the opposite extremes meet, which on the one side are designated by the absolutely decomposable, on the other the indecomposable.—How continuity comes into the absolute discontinuity with which the atomic philosopher sets out, he endeavors to explain by means of cohesive, plastic power, etc. But he does so in vain, for *continuity* is only productivity itself.

The manifoldness of the forms which such a product assumes in its metamorphosis was explained by the difference in the stages of development, such that parallel with every step of development goes a particular form.—The atomic philosopher posits in Nature certain fundamental forms, and since in it everything strives toward form, and everything which does form itself also has its *particular form*, so the fundamental forms must be conceded, but certainly only as *indicated* in Nature, not as *actū* existent.

From the standpoint of reflection, the becoming of this product must appear as a continual striving of the original actants toward the production of a determinate form, and a continual annihilation of those forms again.

[302] Thus, the product would not be the product of a simple tendency—it would only be the visible expression of an internal proportion, of an internal equipoise of the original actants, which neither reduce themselves mutually to absolute formlessness, nor yet do they allow the production of a determinate and fixed form, on account of the universal conflict.

Until now (so long as we have had to deal merely with ideal factors), opposite directions of investigation have been possible; from this point, since we have to pursue a real product in its developments, there is only one direction.

(m) By the unavoidable separation of productivity into opposite directions at every single stage of development the product itself is separated into *individual products* by which, however, for that very reason, only different stages of development are marked.

That this is so may be shown *either* in the products themselves, as is done when we compare them with each other with regard to their form and seek a continuity of formation. This is an idea which, from the fact that continuity is never in the *products* (for the reflection), but always only in the *productivity*, can never be perfectly realized.

In order to find continuity in productivity, the successive steps of the *transition of productivity into product* must be more clearly exhibited than they have been until now.—By the fact that the productivity gets *limited* (see above), we have in the first instance only the inception of a product, only the fixed point for the productivity overall.—It must be shown how the productivity gradually materializes itself and changes itself into products ever more and more fixed, so as to produce a *dynamically graduated scale in Nature*, and this is the real subject of the fundamental problem of the whole system.

(In advance, the following may serve to throw light on the subject.—In the first place, a diremption of the productivity is demanded; the cause through which this diremption is effected remains in the first instance altogether outside of the investigation. [303]—An alternation of contraction and expansion is perhaps conditioned by diremption. This alternation is not something in matter, but is *matter itself*, and the first stage of productivity passing over into product.—*Product* cannot be reached except through a stoppage of this change, that is, through a *third* factor which *fixes* that change itself, and thus matter in its lowest stage—in the *first* power—would be an object of intuition; that change would be seen in rest, or in equilibrium, just as, conversely again, by the cancellation of the third factor, matter might be raised to a higher power.—Now it might be possible that those products just deduced stood upon *quite different levels* of materiality, or *of that transition*, or that those different levels were more or less *distinguishable* in the one than in the other—that is, a *dynamically graduated scale of those products* would thereby have to be demonstrated.)

(n) In the *solution* of the problem itself we shall continue in the direction hitherto taken, for the time being, without knowing where it may lead us.

Individual products are brought into Nature; but in these products productivity, *as* productivity, is still held to be always distinguishable. Productivity has not yet absolutely passed over into product. The subsistence of the product is supposed to be a continual self-reproduction. The problem arises, by what is this absolute transition—exhaustion of the productivity in the product—prevented? Or by what means does its subsistence become a continual self-reproduction?

It is absolutely unthinkable how the activity that everywhere tends toward a product is prevented from going over into it *entirely*, unless that transition is prevented *by external influences*, and the product, if it is to subsist, is compelled at every moment to reproduce itself *anew*.

Up to this point, however, no trace has been discovered of a cause opposed to the product (to organic nature).—Such a cause can, therefore, at present, only be postulated. (We thought [304] we saw the whole of Nature exhaust itself in that product, and it is only here that we note that in order to comprehend such a product *something else* must be presupposed, and a new antithesis must come into Nature. Nature has been for us absolute *identity* in duplicity—here we come upon an antithesis that must again take place *within* the other.—This antithesis must be capable of being shown in the deduced product itself, if it is capable of being deduced at all.)

The deduced product is an activity *directed outward*—this cannot be distinguished *as such* without an activity *directed inward from without* (i.e., directed upon itself), and this activity, on the other hand, cannot be thought unless it is *counteracted* (reflected) from without.

In the opposite directions, which arise through this antithesis, lies the principle for the construction of all the phenomena of life—upon the cancellation of those opposite directions, life remains over either as *absolute activity* or *absolute receptivity*, since it is only possible as the perfect *reciprocal determination* of receptivity and activity.

We therefore refer the reader to the *Outline* itself, and merely call his attention to the higher stage of construction which we have here reached.

We have above (g) explained the origin of a *product generally* by a struggle of Nature against the original point of inhibition, through which this point is raised to a full sphere, and thus receives permanence.—Here, since we are deducing a struggle of *external* Nature, not against a *mere* point, but against a *product*, the first construction rises for us to a *second* power, as it were; we have a doubled product (and thus it might well be shown subsequently that organic nature generally is only the higher power of the inorganic, and that it rises above the latter for the very reason that in it precisely that which was already product *again* becomes product).

[305] Since the product, which we have deduced as the most primary, drives us to a side of Nature that is opposed to it, it is clear that our construction of the origin of a product generally is *incomplete*, and that we have not yet, by far, satisfied our problem—(the problem of all science is to construct the origin of a fixed product). A productive product, as such, can subsist only under the influence of external forces, because it is only thereby that productivity is interrupted, prevented from being extinguished in the product.—There must now be again a particular sphere for these external forces; these forces must lie

in a world which is *not productive*. But that world, for this very reason, would be a world fixed and undetermined in every respect. The problem of how a product comes to exist in Nature has therefore received a onesided solution through all that has preceded. "The product is inhibited by diremption of the productivity at every single stage of development." But this is true only for the *productive* product, whereas we are here dealing with a *nonproductive* product.

The contradiction that we encounter here can be resolved only by finding a *general* expression for the construction of a *product generally* (regardless of whether it is productive or has ceased to be so).



Since the existence of a world that is *not productive* (inorganic) is for the time being merely postulated in order to explain the productive one, its conditions can be laid down only hypothetically; and as we do not in the first instance know it at all except through its opposition to the productive, those conditions likewise must be deduced only from this opposition.—(From this it is of course clear (also referred to in the *Outline*) that this second section, as well as the first, contains throughout merely hypothetical truth, since neither organic nor inorganic nature is explained without our having reduced the construction of the two to a common expression, which, however, is possible only [306] through the synthetic part.—This must lead to the highest and most universal principles for the construction of a *Nature* generally; hence we must refer the reader who is concerned about a knowledge of our system altogether to that part.)—The hypothetical deduction of an inorganic world and its conditions we may pass over here all the more readily, since they are sufficiently detailed in the *Outline*, and hasten to the most universal and highest problem of our science.



The most universal problem of speculative physics may now be expressed thus: *to reduce the construction of organic and inorganic products to a common expression*. We can only provide the main principles of such a solution, and of these, for the most part, only such as have not been completely deduced in the *Outline* itself (third principal division).

A.

Here at the very beginning we lay down the principle that *since the organic product is the product in the second power, the ORGANIC construction of the product must be, at least, the sensuous image of the ORIGINAL construction of EVERY product*.

(a) In order that the productivity may be at all fixed at a point, *limits must be given*. Since *limits* are the condition of *the first phenomenon*, the *cause* through which limits are produced *cannot be a phenomenon*, it withdraws into the interior of Nature, or the interior of each respective product. In organic nature, this limitation of productivity is shown by what we call *sensibility*, which must be thought as the first condition of the construction of the organic product.

(b) The immediate effect of confined productivity is an *alternation of contraction and expansion* in the matter already given, and as we now know, constructed, as it were, for the second time.

[307] (c) Where this alternation ceases, productivity passes over into product, and where it is again restored, product passes over into productivity.—For since the product must remain productive to infinity, *those three stages of productivity must be capable of being* DISTINGUISHED in the product; the absolute transition of the latter into product is the canceling of product itself.

(d) Just as these three stages are distinguishable in the *individual*, they must be distinguishable *in organic nature as a whole*, and the graduated series of organizations is nothing more than a graduated scale of *productivity itself*. (Productivity exhausts itself to degree *c* in the product A, and can begin with the product B only at the point where it left off with A, that is, with degree *d*, and so on downward to the *vanishing* of all productivity. If we knew the absolute *degree* of productivity of the *Earth* for example (which is determined by the Earth's relation to the Sun) the limit of organization upon it might be more accurately determined by this means than by incomplete experience—which must be incomplete for this reason, if for no other, that the catastrophes of Nature have, beyond doubt, swallowed the last links of the chain.—A true system of natural history, which has for its object not the *products* of Nature but *Nature itself*, follows the *one* productivity that battles, so to speak, against freedom, through all its windings and sinuosities, to the point at which it is at last compelled to perish in the product.)

It is upon this dynamical graduated scale in the individual, as well as in the whole of organic nature, that the construction of all organic phenomena rests.

B.*

These principles, stated universally, lead to the following fundamental principles of a universal theory of Nature.

[308] (a) Productivity must be *primarily* limited. Since *outside* of limited productivity there is[†] *pure identity*, the limitation cannot be established

* (From this point onward, there are, as in the *Outline*, additions in notes, included in the SW text.—Trans.)

† only

by a difference already existing, and therefore must be furnished by *an opposition arising in productivity itself*, to the existence of which we here revert as a first postulate.*

(b) This difference thought *purely* is the first condition of all[†] activity, the productivity is attracted and repelled[‡] between opposites (the primary limits); in this alternation of expansion and contraction there necessarily arises a common element, but one which exists only *in change*.—If it is to exist *outside* of change, then the *change itself* must become fixed.—The active factor in change is the productivity sundered within itself.

(c) It is asked:

(α) By what means such alternation can be fixed at all.—It cannot be fixed by anything that is contained as a *member* in the alternation itself, and must therefore be fixed by a *tertium quid*.

(β) But this *tertium quid* must be able to *prehend* that original antithesis; however, *outside* of that antithesis nothing *exists*[§]—it^{||} must therefore be originally contained in it, as something that is mediated by the antithesis, and by which in turn the antithesis is mediated; for otherwise there is no reason why it should be originally contained in that antithesis.

[309] The antithesis is dissolution of identity. But Nature is *primarily* identity.—In that antithesis, therefore, there must again be a striving toward identity. This striving is immediately conditioned *through* the antithesis; for if there was no antithesis, there would be identity, absolute rest, and therefore no striving toward identity.[#]—If, on the other hand, there were not identity in the antithesis, the antithesis itself could not endure.

Identity produced from difference is indifference; that *tertium quid* is therefore a *striving toward indifference*, a striving which is conditioned by the difference itself, and by which it, on the other hand, is conditioned.—(The

*The first postulate of natural science is an antithesis in the pure identity of Nature. This antithesis must be thought quite purely, and not with any other substrate besides that of activity; for it is the condition of all substrate. The person who cannot think activity or opposition without a substrate cannot philosophize at all. For all philosophizing only concerns the deduction of a substrate.

[†]natural

[‡]The phenomena of electricity show the scheme of nature oscillating between productivity and product. This condition of oscillation or change, attractive and repulsive force, is the real condition of formation.

[§]For it is the only thing that is given us to derive all other things from.

^{||}that *tertium quid*

[#]That *tertium quid* 1) must be directly determined through the antithesis; 2) the antithesis must likewise be conditioned through that third factor. Now by what is the antithesis conditioned? It is antithesis only by virtue of that *striving* toward identity. For where there is no striving toward unity, there is no antithesis.

difference must not be looked upon as a difference at all, and is nothing for intuition, except through a third that sustains it—to which change itself adheres.)

This *tertium quid*, therefore, is the exclusive substrate in that primal alternation.—But substrate posits change as much as change posits substrate—and there is here no first and no second, but difference and striving toward indifference, are, as far time is concerned, one and contemporary.

Axiom. No identity in Nature is absolute, but all is only indifference.*

Since that *tertium quid* itself *presupposes* the primary antithesis, the antithesis itself cannot be *absolutely* canceled by it; *the condition of the continuance of that tertium quid*[†] *is the perpetual continuance of the antithesis*, just as, conversely, *the continuance of the antithesis is conditioned by the continuance of the tertium quid*.

But how, then, shall the antithesis be thought as enduring?

We have one primary antithesis, between the limits of which all Nature must lie; if we assume that the factors of this antithesis [310] can really pass over into each other, or come together absolutely in some *tertium quid* (some individual product), then the antithesis is removed, and along with it the *striving*, and so all the activity of Nature.—But that the antithesis should endure is thinkable only by its being *infinite*—by the extreme limits being held asunder to infinity, *so that always only the mediating links of the synthesis, never the last and absolute synthesis itself, can be produced*, in which case it is only *relative points of indifference* that are always attained, never absolute ones, and every successively originated difference leaves behind a new and still unremoved antithesis, and this again passes into indifference, which, in its turn, *partially* removes the primary antithesis. By virtue of the original antithesis and the striving toward indifference there arises a product, but the product partially does away with the antithesis; *through* the doing away with that part, that is, through the origination of the product itself, there arises a new antithesis, different from the one that has been done away with, and through it, a product different from the first; but even this leaves the *absolute* antithesis in place, therefore duality, and through it a product will arise anew, and so on to infinity.

Let us say, for example, that by the product A, the antitheses *c* and *d* are united; the antitheses *b* and *e* still lie outside of that union. This latter antithesis is done away with in B, but this product also leaves the antithesis *a* and *f* unremoved—if we say that *a* and *f* mark the extreme limits, then the union of these will be that product which can never be reached.

*Nature is an activity that constantly *strives* toward identity, an activity, therefore, which in order to endure *as* such, constantly presupposes the antithesis.

[†]of that third activity, or of Nature

Between the extremes *a* and *f* lie the antitheses *c* and *d*, *b* and *e*; but the series of these intermediate antitheses is infinite; all these intermediate antitheses are included in the one absolute antithesis.—In the product *A*, of *a* only *e*, and of *f* only *d* is canceled; let what remains of *a* be called *b*, and of *f*, *e*; these will indeed, by virtue of the absolute striving toward indifference, become again united, but they leave a new antithesis uncanceled—and so there remains between *a* and *f* an infinite series of intermediate antitheses, and the product in which those absolutely cancel themselves never *is*, but only *becomes*.

This infinitely progressive formation must be thus represented.—The original antithesis would necessarily be canceled in the primal product *A*. The product would necessarily fall at the point of indifference of *a* [311] and *f*; but inasmuch as the antithesis is an absolute one, which can be canceled only in an infinitely continued, never actual, synthesis, *A* must be thought as the center of an infinite periphery (whose diameter is the infinite line *af*). Since in the product of *a* and *f*, only *e* and *d* are united, there arises in it the new division *b* and *e*, and the product will therefore divide up into opposite directions; at the point where the striving toward indifference attains preponderance, *b* and *e* will combine and form a new product different from the first, but between *a* and *f* there still lie an infinite number of antitheses; *B*, the point of indifference, is therefore the center of a periphery which is comprehended in the first, but is itself again infinite, and so on.

The antithesis of *b* and *e* in *B* IS MAINTAINED through *A*, because it* leaves the antithesis *disunified*; so† the antithesis in *C* is *maintained* through *B*, because *B*, in its turn, cancels *only a part* of *a* and *f*. But the antithesis in *C* is maintained through *B*, only insofar as *A* maintains the antithesis in *B*.‡ What therefore in *C* and *B* results *from* this antithesis§ is *occasioned* by the common influence of *A*, so that *B* and *C*, and the infinite number of other products that come as intermediate links between *a* and *f*—are, in relation to *A*, only *one* product.—The *difference*, which remains over in *A* after the union of *c* and *d*, is only *one*, into which then *B*, *C*, etc., again divide.

[312] But the endurance of the antithesis is, in the case of every product, the condition of the striving toward indifference, and thus a striving toward indifference is maintained through *A* in *B*, and through *B* in *C*.—But

*A

†in like manner

‡The whole of the uncanceled antithesis of *A* is carried over to *B*. But again, it cannot entirely cancel itself in *B*, and is therefore carried over to *C*. The antithesis in *C* is therefore maintained by *B*, but only insofar as *A* maintains the antithesis which is the condition of *B*.

§suppose, for example, the result of it were universal gravitation

the antithesis which A leaves uncanceled, is only one antithesis, and therefore also this tendency in B, in C, and so on to infinity, is only conditioned and maintained through A.

The organization thus determined is none other than the organization of the universe in the system of gravitation.—*Gravity is simple*, but its *condition* is duplicity.—Indifference arises only out of difference.—The canceled duality is matter, inasmuch as it is only *mass*.

The *absolute* point of indifference exists nowhere, but is, as it were, divided among several *single* points.—The universe which forms itself from the center toward the periphery *seeks* the point at which even the extreme antitheses of Nature cancel themselves; the impossibility of this canceling guarantees the infinity of the universe.

From every product A, the uncanceled antithesis is carried over to a new one, B, the former by this means becoming the cause of duality and gravitation for B.—(This *carrying over* is what is called “action by distribution,” the theory of which becomes clear only at this point.)*—Thus, for example, the Sun, being only *relative* indifference, maintains, as far as its sphere of action reaches, the antithesis that is the condition of weight upon the subordinate planetary bodies.†

[313] The indifference is canceled at every step, and at every step it is restored. Hence, weight acts upon a body at rest as well as upon one in motion.—The universal restoration of duality, and its recanceling at every step, can‡ appear only as a *nisus* toward a third factor. This third factor§ abstracted from tendency is nothing,|| therefore purely *ideal* (marking only direction)—a point.¶

*That is, distribution exists only when the antithesis in a product is not absolutely but only *relatively* canceled.

†The striving toward indifference attains the preponderance over the antithesis, at a greater or lesser distance from the body which exercises the distribution (as, e.g., at a certain distance the action by distribution which an electric or magnetic body exercises upon another body, appears as canceled). The difference in this distance is the ground of the difference of planetary bodies in one and the same system, inasmuch, namely, as one part of the matter is subjected to indifference more than the rest. Since, therefore, the condition of all product is difference, difference must again arise at every moment as the source of all existence, but must also be thought as again canceled. By this continual reproduction and resuscitation creation takes place anew at every step.

‡that is

§is therefore the pure zero

|| = 0

¶It is precisely zero to which Nature continually strives to revert, and to which it would revert if the antithesis were ever canceled. Let us suppose the original condition of Nature = 0 (lack of reality). Now zero can certainly be thought as dividing itself into $1 - 1$ (for this = 0); but if we posit that this division is not infinite (as it is in the infinite series $1 - 1 + 1 - 1 \dots$), then Nature will, as it were, oscillate continually between zero and unity—and this is precisely its condition.

Gravity* is in the case of every total product only *one*,[†] and so also the relative point of indifference is only *one*. The point of indifference of the *individual* body marks only the line of direction of its tendency toward the universal point of indifference; hence this point may be regarded as the only one at which gravity acts; just as that by whose means alone bodies attain consistency for us is simply this tendency outward.[‡]

Vertical falling toward this point is not a simple, but a compound motion, and it is to be wondered at that this has not been perceived before.[§]

Gravity is not proportional to mass (for what is this mass but an abstraction of the specific gravity which you have hypostatized?); but, conversely, the mass of a body is only the expression of the momentum with which the antithesis in it cancels itself.

[314] (d) With the preceding, the construction of matter in general is completed, but not the construction of specific difference in matter.

That which all the matter of B, C, etc., in relation to A has in *common*, is the difference which is not canceled by A, and which again cancels itself *in part* in B and C—hence, therefore, the gravity mediated by that difference.

What *distinguishes* B and C from A, therefore, is the difference which is not canceled by A, and which becomes the condition of gravity in the case of B and C.—Similarly, what distinguishes C from B (if C is a product subordinate to B), is the difference which is not canceled by B, and which is again carried over to C. Gravity, therefore, is not the same thing for the higher and for the subaltern planetary bodies, and there is as much variety in the central forces of attraction as in their conditions.

The means by virtue of which another difference of individual products is possible (in the products A, B, and C, which, insofar as they are opposed to *each other*, represent products absolutely *homogeneous*^{||}), is the possibility of a difference of relation between the factors in the *canceling*, so that, for example, in X, the positive factor, and in Y, the negative factor has preponderance (thus rendering the one body positively, and the other negatively electrified).—All difference is difference of electricity.[#]

*the center of gravity

†for the antithesis is one

‡Baader on the *Pythagorean Square*, 1798. (Original note.—Trans.)

§Except by the thoughtful author of a review of my work on the *World-Soul* in the *Würzburg Gelehrte Anzeiger*, the only review of that work that has since come to my attention. (Original note.—Trans.)

||because the antithesis is the same for the *whole product*,

#It is here taken for granted that what we call the quality of bodies, and what we are wont to regard as something homogeneous and the ground of all homogeneity, is really only an expression for a canceled difference.

(e) That the identity of matter is not *absolute* identity, but only *indifference*, can be proved from the possibility of again canceling the identity, and from the accompanying phenomena.*—We may be allowed, for brevity's sake, to include this recanceling and its resultant phenomena under the expression [315] *dynamical process*, without, of course, affirming decisively whether anything of the sort is everywhere actual.

Now there will be exactly as many stages in the dynamical process as there are stages of transition from difference to indifference.

(α) The first stage will be marked by objects *in which the reproduction and recanceling of the antithesis at every moment is still itself an object of perception.*

The whole product is reproduced anew at every moment.[†] That is, the antithesis which is canceled in it springs up afresh every moment; but this reproduction of difference loses itself immediately in *universal* gravity.[‡] This reproduction, therefore, can be perceived only in *individual* objects, which seem to gravitate *toward each other*, since, if to the one factor of an antithesis its opposite is offered (in another) *both factors* become *heavy with reference to each other*, in which case, therefore, the universal gravity is not canceled, but a special one occurs *within* the universal.—An instance of such a mutual relation between two products is that of the Earth and the magnetic needle, in which the continual recanceling of indifference in gravitation toward the poles is ascertained.[§] It is the continual sinking back into identity^{||} in gravitation toward the universal point of indifference.—Here, therefore, it is not the *object*, but the *reproduction of the object itself* that becomes object.[#]

[316] (β) At the first stage, the duplicity of the product again appears in the identity; at the second, the antithesis will divide up and distribute itself among different objects (A and B). From the fact that the one factor of the antithesis attained a *relative* preponderance in A, the other in B, there will arise, according to the same law as in (α), a gravitation of the factors *toward each other*, and so a new difference, which, when the relative equilibrium is restored

*(According to SW, the last part of this sentence reads as follows.—Trans.) The construction of quality ought necessarily to be capable of experimental proof, by recanceling of the identity, and of the phenomena which accompany it.

[†]Every body must be thought as reproduced at every step, and therefore also every total product.

[‡]The *universal*, however, is never perceived, for the simple reason that it is universal.

[§]By which what was said above is confirmed, that falling toward the center is a compound motion.

^{||}The reciprocal canceling of opposite motions.

[#]Or the object is seen in the first stage of becoming, or of transition from difference to indifference. The phenomena of magnetism even serve, so to speak, as an incentive to transport us to the standpoint beyond the product, which is necessary in order for the construction of the product.

in each, results in *repulsion*.*—(Alternation of attraction and repulsion, *second* stage in which matter is seen)—Electricity.

(γ) At the second stage the one factor of the product had only a *relative* preponderance.[†] At the third it will attain an *absolute* one—in the two bodies A and B, the original antithesis is again completely represented—matter will revert to the *first stage* of becoming.

At the *first stage* there is still *PURE difference*, without substrate;[‡] at the second stage it is the *simple* factors of two *PRODUCTS* that are opposed to each other; at the third it is the *PRODUCTS THEMSELVES* that are opposed; here is difference in the *third* power.

If two *products* are absolutely opposed to each other,[§] then in each of them singly indifference of *gravity* (by which alone each *is*) must be *canceled*, and they must gravitate *toward each other*.^{||} (In the second stage there was only a mutual [317] gravitating of the *factors* to each other—here there is a gravitating of the *products*.)[#]—This process, therefore, first assails the *indifferent element of the PRODUCT*, that is, the products themselves dissolve.

Where there is equal difference there is equal indifference; difference of *products*, therefore, can end only with *indifference of products*.—(All indifference deduced until now has been only indifference of substrateless, or at least simple, factors.—Now we come to speak of an indifference of products.) This striving will not cease until a joint product exists. The product, in forming itself, passes, from both sides, through all the intermediate links that lie between the two products,** until it finds the point at which it succumbs to indifference, and the product is fixed.

*There will result the opposite effect—a negative attraction, that is, repulsion.—Repulsion and attraction stand to each other as positive and negative magnitudes. Repulsion is only negative attraction, attraction only negative repulsion; as soon, therefore, as the maximum of attraction is reached, it passes over into its opposite, into repulsion.

[†]If we designate the factors as + and – electricity, then, in the second stage, + electricity had a relative preponderance over – electricity.

[‡]for it was only out of it that a substrate arose

[§]If the individual factors of the two products are no longer opposed, but the whole products themselves are absolutely opposed to each other

^{||}For a product is something in which antithesis cancels itself, but it cancels itself only through indifference of gravity. When, therefore, two products are opposed to each other, the indifference in each *individually* must be absolutely canceled, and the whole products must gravitate toward each other.

[#]In the electric process, the *whole product is not* active, but only the one factor of the product, which has relative preponderance over the other. In the chemical process in which the *whole product is* active, it follows that the indifference of the whole product must be canceled.

**for example, through all the intermediate stages of specific gravity

General Remark.

By virtue of the first construction, the product is posited as identity; this identity, it is true, again resolves itself into an antithesis, which is no longer an antithesis cleaving to *products* however, but an antithesis in the *productivity* itself.—The product, therefore, as product, is* identity.—But even in the sphere of products, there again arises a duplicity in the second stage, and it is only in the third that even the duplicity of the *products* again becomes *identity* of the products.†—There is therefore here too a progress from thesis to antithesis, and thence to synthesis.—The final synthesis of [318] matter concludes in the chemical process; if composition is to proceed yet further in it, then this circle must open again.

We must leave it to our readers themselves to make out the conclusions to which the principles here stated lead, and to consider the universal interdependence which is introduced by them into the phenomena of Nature.—Nevertheless, to give one instance: when in the chemical process the bond of gravity is loosed, the phenomenon of *light* which accompanies the chemical process in its greatest perfection (in the process of combustion) is a remarkable phenomenon which, when followed out further, confirms what is stated in the *Outline*, page 100: “The action of light must stand in secret interdependence with the action of gravity which the central bodies exercise.”—For, is not the indifference dissolved at every step, since gravity, as ever active, presupposes a continual canceling of indifference?—It is thus, therefore, that the Sun, by the distribution exercised on the Earth, causes a universal separation of matter into the primary antithesis (and hence gravity). This universal canceling of indifference is what appears to us (who are endowed with life) as *light*; wherever, therefore, that indifference is dissolved (in the chemical process), there *light must* appear to us.—According to the foregoing, there is *one* antithesis which, beginning at magnetism and proceeding through electricity, finally dissipates in the chemical phenomena.‡ In the chemi-

*was

†We have therefore the following scheme of the dynamical process. First stage: Unity of the product—magnetism. Second stage: Duplicity of the products—electricity. Third stage: Unity of the products—chemical process.

‡The conclusions which may be deduced from this construction of dynamical phenomena are partly anticipated in the preceding. The following may serve for further explanation. The chemical process, for example, in its highest perfection, is a process of combustion. Now I have already shown on another occasion that the condition of light in the body undergoing combustion is nothing else but the maximum of its positive electrical condition. For it is always the positively electrical condition that is also the combustible. Might not, then, this coexistence of the phenomenon of light with the chemical process in its highest perfection give us information about the ground of *every* phenomenon of light in Nature? What happens, then, in the chemical process? Two whole products gravitate toward each other. The *indifference* of the *individual* is therefore *absolutely* canceled. This absolute canceling of indifference puts the whole body into the condition of light, just as the partial cancel-

cal process, that is, [319] *the whole product* becomes +E or -E (the *positively* electric body, in the case of absolutely *uncombusted* bodies, is always the *more combustible*.* Whereas the *absolutely incombustible* is the cause of every *negatively* electric condition). And if we may be allowed to invert the case, what else are bodies themselves but condensed (confined) electricity?—In the chemical process the whole body dissolves into +E or -E. Light is everywhere the appearing of the *positive* factor in the primary antithesis; hence, wherever the antithesis is restored, *light* is there for us, because generally only the positive factor is beheld, and the negative one is only felt.—Is the connection of the diurnal and annual deviations of the magnetic needle with light now conceivable—and, if in every chemical process the antithesis is dissolved—is it conceivable that light is the cause and beginning of all chemical processes?†

ing in the electric process puts it into a partial condition of light. Therefore, the light too that seems to stream to us from the sun is nothing else but the phenomenon of indifference canceled at every step. For as gravity never ceases to act, its condition—the antithesis—must be regarded as springing up again at every step. We should thus have in light a continual, visible phenomenon of gravitation, and it would be explained why, in the planetary system, it is exactly those bodies which are the principal seat of gravity that are also the principal source of light. We should then, also, have an explanation of the connection *in which* the action of light stands to that of gravitation.

The manifold effects of light on the deviations of the magnetic needle, on atmospheric electricity, and on organic nature, would be explained by the very fact that light is the phenomenon of indifference continually canceled—therefore, the phenomenon of the dynamical process continually rekindled. There is, therefore, one antithesis that prevails in all dynamical phenomena—in those of magnetism, electricity and light; for example, the antithesis that is the condition of the electrical phenomena must already enter into the first construction of matter; for all bodies are certainly electrical.

*Or rather, conversely, the more combustible is always also the positively electric; whence it is manifest that the body which burns has merely reached the maximum of + electricity.

†And indeed it is so. What then is the absolutely incombustible? Doubtless, simply that by means of which everything else burns—oxygen. But it is precisely this absolutely incombustible oxygen that is the principle of negative electricity, and thus we have a confirmation of what I have already stated in the *Ideas for a Philosophy of Nature*, i.e., that oxygen is a principle of a negative kind, and therefore the representative, as it were, of the power of attraction; whereas phlogiston, or, what is the same thing, positive electricity, is the representative of the positive, or of the force of repulsion. There has long been a theory that the magnetic, electric, chemical, and, finally, even the organic phenomena, are interwoven into one great interdependent whole. This must be established.—It is certain that the connection of electricity with the process of combustion may be shown by numerous experiments. One of the most recent of these that has come to my knowledge I will cite. It occurs in Scherer's *Journal of Chemistry*. If a Leyden jar is filled with iron filings, and repeatedly charged and discharged, and if after the lapse of some time this iron is taken out and placed upon an isolator-paper, for example, it begins to get hot, becomes incandescent, and changes into an oxide of iron.—This experiment deserves to be frequently repeated and more closely examined—it might readily lead to something new.

This great interdependence, which a scientific system of physics must establish, extends over the whole of Nature. It must, therefore, once established, shed a new light on the *history* of the

[320] (f) *The dynamical process is nothing but the second construction of matter, and as many stages as there are in the dynamical process, there are the same number in the original construction of matter.*

[321] This axiom is the converse of axiom (e).^{*} That which, in the dynamical process, is perceived in the product, takes place *beyond* the product with the simple factors of all duality. The first inception of original production is the limitation of productivity through the primitive antithesis, which, *as* antithesis (and as the condition of all construction), is distinguished only in *magnetism*; the second stage of production is the *alternation* of contraction and expansion, and *as* such becomes visible only in *electricity*; finally, the third stage is the transition of this change into indifference, a change which is recognized as such only in *chemical* phenomena.

MAGNETISM, ELECTRICITY, AND CHEMICAL PROCESS are the *categories* of the original construction of Nature[†]—the latter escapes us and lies outside of intuition, the former are what of it remains behind, what stands firm, what is fixed—the general schemata for the construction of matter.

And (in order to close the circle at the point where it began), just as in organic nature, where in the graduated series of sensibility, irritability, and formative drive the secret of the production of the *whole of organic nature* lies in each individual, so in the graduated series of magnetism, electricity, and chemical process, so far as the series of powers can be distinguished in the individual body, is to be found the secret of the production of *Nature from itself*^{‡,§}

whole of Nature. Thus, for example, it is certain that all geology must start from terrestrial magnetism. But terrestrial electricity must again be determined by magnetism. The connection of North and South with magnetism is shown even by the irregular movements of the magnetic needle.—But again, with universal electricity, which, no less than gravity and magnetism, has its indifference point—the universal process of combustion and all volcanic phenomena stand in connection.

Therefore, it is certain that there is one chain going from universal magnetism down to the volcanic phenomena. Still these are all only scattered experiments. In order to make this interdependence *fully* evident, we need the central phenomenon, or central experiment, of which Bacon speaks oracularly—I mean the experiment wherein all those functions of matter, magnetism, electricity, etc., so run together in one phenomenon that the *individual* function is distinguishable—proving that the one does not lose itself immediately in the other, but that each can be exhibited separately, an experiment which, when it is discovered, will stand in the same relation to the *whole* of Nature, as galvanism does to organic nature.

^{*}*Proof:* All dynamical phenomena are phenomena of transition from difference to indifference, but it is in this very transition that matter is primarily constructed.

[†]of matter

[‡]of the whole of Nature

[§]Every individual is an expression of the whole of Nature. As the existence of the *single* organic individual rests on that graduated series, so does the whole of Nature. Organic nature maintains

[322]

C.

We have now approached nearer the solution of our problem, which was to reduce the construction of organic and inorganic nature to a common expression.

Inorganic nature is the product of the *first* power, organic nature of the *second** (this was demonstrated above; it will soon appear that the latter is the product of a still higher power).—Hence the latter, in view of the former, appears contingent; the former, in view of the latter, necessary. Inorganic nature can take its origin from *simple* factors, organic nature only from *products*, which again become factors. Hence an inorganic nature generally will appear as having been from all eternity, organic nature as having *originated*.

In organic nature, indifference can never come to be in the same way in which it comes to exist in inorganic nature, because life consists in nothing more than a continual *prevention of the attainment of indifference*,† through which there manifestly comes about a condition which is only, so to speak, extorted from Nature.

By organization, matter, which has already been composed for the second time by the chemical process, is once more thrown back to the initial point of formation (the circle above described is again opened); it is no wonder that matter always thrown back again into formation at last returns as a perfect product.

[323] The same stages through which the production of Nature originally passes, are also passed through by the production of the organic product; only that the latter, even *in the first stage*, at least begins with products of the *simple* power.—Organic production also begins with limitation, not of the *primary* productivity, but of the *productivity of a product*; organic formation also takes place through the alternation of expansion and contraction, just as primary formation does; but in this case it is a change taking place, not in the simple productivity, but in the compound.

the whole wealth and variety of its products only by continually changing the relation of those three functions.—In like manner inorganic Nature brings forth the whole wealth of its products only by changing the relation of those three functions of matter to infinity; for magnetism, electricity, and chemical process are the functions of matter generally, and on that ground alone are they categories for the construction of all matter. The fact that those three factors are not phenomena of special kinds of matter, but *functions of all matter universally*, gives its real, and its innermost sense to dynamical physics, which, by this circumstance alone, rises far above all other kinds of physics.

*That is, the organic product can be thought only as subsisting under the hostile onslaught of an external nature.

†in prevention of the absolute transition of productivity into product

But there is all of this, too, in the chemical process,* and yet in the chemical process indifference is attained. The vital process, therefore, must again be a higher power of the chemical; and if the schema that lies at the base of the latter is duplicity, the schema of the former will of necessity be *triplicity*.† But the schema of triplicity is‡ that§ of the galvanic process (Ritter's demonstration, etc., p. 172); therefore, the galvanic process (or the process of excitation) stands a power higher than the chemical, and the third element, which the latter lacks and the former has, prevents indifference from being arrived at in the organic product.||

As excitation does not allow indifference to be arrived at in the individual product, and since the antithesis is still there (for the primary antithesis still pursues us),# there remains for Nature no alternative [324] but separation of the factors into *different* products.**—The formation of the individual product, for that very reason, cannot be a completed formation, and the product can never cease to be productive.††—The contradiction in Nature is that the product must be *productive*,‡‡ and that, notwithstanding, the product, *as a product of the third power*, must pass over into indifference.§§ This contradiction Nature tries to re-

*The chemical process, too, does not have substrateless or simple factors; it has *products* for factors.

†the former will be a process of the third power

‡in reality

§the fundamental schema

||The same deduction is already furnished in the *Outline*, p. 118.—What the dynamical action is, which according to the *Outline* is also the cause of excitability, is now surely clear enough. It is the *universal action* which is everywhere conditioned by the cancellation of indifference, and which at last tends toward intussusception (indifference of products) when it is not continually prevented, as it is in the process of excitation. (Original note.—Trans.)

#The abyss of forces down into which we gaze here opens up with the single question: in the *first* construction of our Earth, what can have been the ground of the fact that no genesis of new individuals is possible upon it, otherwise than under the condition of opposite powers? Compare an utterance of Kant on this subject, in his *Anthropology*. (Original note.—Trans.)

**The two factors can never be *one*, but must be separated into different *products*—in order that thus the difference may be permanent.

††In the product, indifference of the first and second powers is arrived at (for example, by excitation itself comes an origin of *mass* [i.e., indifference of the first order], and even chemical *products* [i.e., indifference of the second order] are reached), but indifference of the third power can never be reached, because it is a contradictory idea. (Original note, excluding bracketed additions.—Trans.)

‡‡i.e., a product of the third power

§§The product is productive only from the fact of its being a product of the third power. But the idea of a productive product is itself a contradiction. What is productivity is not product, and what is product is not productivity. Therefore a product of the third power is itself a contradictory idea. From this it is even manifest what an extremely artificial condition life is—wrenched, as it were, from Nature—subsisting against the will of Nature.

solve by mediating *indifference* itself through *productivity*, but even this does not succeed, for the act of productivity is only the kindling spark of a new process of excitation; the product of productivity is a *new productivity*. The productivity of the *individual* now indeed passes over into this as its product; the individual, therefore, ceases to be productive more rapidly or slowly, and Nature reaches the point of indifference with it only after the latter has descended to a product of the second power.*

[325] And now the result of all this?—The condition of the inorganic (as well as of the organic) product, is duality. In any case, however, the organic *productive product* is so only from the fact that the difference NEVER becomes indifference.

It is[†] therefore *impossible* to reduce the construction of organic and of inorganic product to a *common* expression, and the problem is incorrect, and therefore the solution impossible. The problem presupposes that organic product and inorganic product are mutually *opposed*, whereas the latter is only the *higher power* of the former, and is produced only by the higher power of the forces through which the latter also is produced.—Sensibility is only the higher power of magnetism; irritability only the higher power of electricity; formative drive only the higher power of the chemical process.—But sensibility, irritability, and formative drive are all only included in that *one* process of excitation. (Galvanism affects them all).[‡] But if they are only the higher

*Nothing shows more clearly the contradictions out of which life arises, and the fact that it is altogether only a heightened condition of *ordinary* natural forces, than the contradiction of Nature in what it tries, but tries in vain, to reach through the *sexes*.—Nature *bates* sex, and where it does arise, it arises against the will of Nature. The separation into sexes is an inevitable fate, with which, after Nature is once organic, it must put up, and which it can never overcome.—By this very hatred of separation it finds itself involved in a contradiction, inasmuch as what is odious to Nature it is compelled to develop in the most careful manner, and to lead to the summit of existence, as if it did so on purpose; whereas it is always striving only for a return into the identity of the genus, which, however, is enchained to the (never to be canceled) duplicity of the sexes, as to an inevitable condition.—That Nature develops the individual only from compulsion, and for the sake of the genus, is manifest from this, that wherever in a genus it *seems* desirous of maintaining the individual longer (though this is never really the case), it finds the genus becoming more uncertain, because it must hold the sexes farther asunder and, as it were, make them flee from each other. In this region of Nature, the decay of the individual is not so visibly rapid as it is where the sexes are nearer to each other, as in the case of the rapidly withering flower, in which, from its very birth, they are enclosed in a calix as in a bridal bed, but in which for that very reason the *genus* is *better secured*.

Nature is the *laziest of animals* and curses separation because it imposes upon it the necessity of activity; Nature is active only in order to rid itself of this compulsion. The opposites must forever shun, in order forever to seek each other; and forever seek, in order never to find each other; it is only in *this* contradiction that the ground of all the activity of Nature lies. (Original note.—Trans.)

[†]insofar

[‡]Its effect upon the power of reproduction (as well as the reaction of particular conditions of the latter power upon galvanic phenomena) is less studied still than might be needful and useful. See the *Outline*, p. 120. (Original note.—Trans.)

functions of magnetism, electricity, etc., there must again [326] be a higher synthesis for these in Nature.* And this, however, it is certain, can be sought for only in Nature, insofar as, viewed as a whole, it is *absolutely* organic.

And this, moreover, is also the result to which the genuine science of nature must lead, i.e., that the difference between organic and inorganic nature is only in Nature as object, and that Nature as originally productive soars above both.†

There remains only one remark which we may make, not so much on account of its intrinsic interest, as in order to justify what we said above in regard to the relation of our system to the current so-called dynamical system.—If it were asked, for instance, in what form our original antithesis, canceled, or rather fixed, in the product, would appear from the standpoint of reflection, we cannot better designate what is found in the product by analysis than as *expansive* and *attractive* (retarding) *force*, to which then, however, *gravitation* must always be added as the *tertium quid*, by virtue of which those opposites become what they are.

Nevertheless, the designation is valid only for the standpoint of reflection or of *analysis*, and cannot be applied for *synthesis* at all; and thus our system leaves off exactly at the point where the dynamical physics of Kant and his successors begins, namely, at the antithesis as it presents itself in the *product*.

And with this the author delivers over these *Elements of a System of Speculative Physics* to the thinking heads of the age, begging them to make common cause with him in this science—which opens up views of no mean order—and to make up by their own powers, knowledge and external relations, for what, in these respects, he lacks.

*Compare above note, p. 199. (Original note.—Trans.)

†That it is therefore the same Nature, which, by the same forces, produces organic phenomena, and the universal phenomena of Nature, and that these forces are in a heightened condition in organic nature.