Sherds of *Physis* Shattered

A physicist's testimony on physics, modern & postmodern physics

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> *"Nennen Sie es doch beim Namen: die Wissenschaft ist uns nur ein Vorwand, um etwas zu tun, irgend etwas, gleichgültig was; das Leben, das furchtbare, entsetzliche Leben hat uns die Seele verdorrt, unser eigenstes innerstes Ich gestohlen, und, um nicht immerwährend aufschreien zu müssen in unserm Jammer, jagen wir kindischen Marotten nach—um zu vergessen, was wir verloren haben. Nur, um zu vergessen. Belügen wir uns doch nicht selbst!"*
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> G. Meyrink, "Der Kardinal Napellus"

Having been functioning[1] in this field for some twelve years not altogether without "success"—and hence, although this would have by no means been indispensable, having fulfilled, even if only minimally, Hamvas's criterion[2] —we wish to expose some typical conceptual features of physics, the queen of modern "sciences", and as such obviously one of the most prominent shapers of modern world and Weltanschauung.

Our methodology will be that as the paper proceeds we continuously adopt more and more particular viewpoints, while in the end we conclude again from an elevated perspective. This is necessary since—while according to the highest point of view we need not have started at all—according to all viewpoints we are to adopt, we will arrive at a stage where we would not need to continue anymore. For various reasons, however—and some will perhaps be revealed by the end—we wish to accomplish this descent.

[1] We are deliberately avoiding the contaminated term *work*ing, which has lost all its qualities by today. In this sense bereft of quality it could not even be applied in this field, of course. It will become apparent, however, that in the postmodern era, journeywork is very much present in sciences.

[2] We are referring to the writer Béla Hamvas, who, in an essay introducing Guénon, wrote: "[Tradition] is the most decisive and only available intellectual move of our age solely for those who, after ten-twenty-thirty years of labour, became disenchanted by the whole of the scientific and philosophic endeavours of modern man, and laid it aside definitely." For the sake of the author's further apology we have to note, however, that we have never been sectarians of scientism, and during all these years, we have ever more intensively oriented ourselves towards Tradition.

I Introduction

There are three things of utmost importance which get lost for outsiders and often even for the so-called physicists. Therefore, these are to be clarified before all else: firstly, what the legitimate domain of validity of physics is; secondly, that its statements can never be absolute; and thirdly, that furthermore physical theories and hence all results derived from them, are on several levels of consideration *non-exact.* An interesting research topic in itself, although even more particular than our present topic, would be to investigate on exactly which level of the dissemination of science these facts, which so obviously spoil scientific mythologies, get suppressed. It is certain for example that they are already mostly ignored by high-school teachers, and since on this level the overwhelming majority of people stop pursuing science forever (beyond flat popular science—which is nothing else than the spreading of scientific mythologies), this situation favours the propagation of these mythologies.[3]

To be able to expose these facts, first of all we have to explore the genesis of physical theories, what a physicist means by "understanding" something, and in what ways and means such a theoretical understanding becomes a physical result, and furthermore, what is in fact to be regarded as a physical result. Then already from a lower perspective can we show at what stages in these ways and means the exactness gets lost.

Definitions Physical theory is a mathematical model for *empirically* observable phenomena, stemming always from the strictly *materialistic* level of reality, set up in an *inductive* way by invoking certain *working hypotheses.* That is, it is a mathematical procedure or mechanism which takes the parameters of the phenomenon as input, and as output yields a set of measurable quantities related to the phenomenon. This set of quantities is to be regarded as a physical result, so these are ultimately *numbers* which can be compared with the ones read by the experimenter from the display of some measurement device, or can be given to the engineer with the prescription that if these quantities (length, mass, current, etc.) are appropriately realised, then his device will function correctly.

Immediate consequences From the first two attributes of physical theories, the empirical-materialistic origin, it immediately follows that physics and hence modern sciences, can neither prove nor refute the existence of other, that is, non-empirical – non-material realities;[4] their existence or possibility of existence, stands strictly outside its horizon: *it is unable to touch them.* Therefore it should be obvious, but for the sake of completeness we articulate: Such conceptions that with the help of physics (maybe in the future, as a result of further development), questions pertaining for instance to the existence of God can be answered, are *gross blasphemy;* similarly to concepts which consider physics the research into the "thoughts of God".[5] Likewise, it is blasphemous to believe that modern sciences can answer questions concerning—and taking examples from the modern world a very long list

[3] Cf. René Guénon, *The Reign of Quantity & the Signs of the Times,* Chapter XVIII. "Scientific mythology and vulgarisation".

[4] Including for example the subtle domains of reality, which fall within the powers of magic, the angelic worlds, or the other world in general.

[5] For an account of the total incompetence of not only the scientific but the whole of rational reasoning in such questions cf. Frithjof Schuon, *The Transcendent Unity of Religions,* introductory chapters.

could follow here, but we highlight only a few—the origin or end of the world or mankind, the workings of history and society, the origin and essence of living nature and the things to be found therein, or to mention some more particular examples as well, the origin of maladies and the true nature of healing, and the essence and ultimate aim of genders and sexuality.[6] The consequences of conceiving such things on a collective level, or constantly suggesting such things through all sorts of channels, and ultimately making this way of thinking the foundation of a civilisation, can be very well perceived when looking around in the modern world with eyes to see. Naturally, only a sacred science can make statements about these essentially sacred things on their merits.[7]

And from the second attribute, the inductive origin of physical theories, it follows that it will never be able to say a single definite word even about things belonging to its own order.[8] It can make only *strictly positive statements,* so for example it cannot disprove either that the aforementioned realities of different order may exhibit influence on the materialistic plane as well.

"Interpretations" of the theories ⇀ This is, however, not all, because physical theories have another aspect, since man is incapable of effective discursive cogitation in a fully abstract way, without pictures: hence the mathematical aspect of the theories is almost always accompanied by certain mental models, and really these are regarded by physicists as physical understanding or "physical picture". These are mental mechanisms which can be operated without mathematical apparatus, and hence certain conclusions can be drawn. These pictures already almost always verge on the "interpretation" of the theories, and as an important characteristic they are rather subjective. Indeed, during discussions among physicists it is a common experience how different what is meant by physical understanding for different individuals can be, and the similarity of this considerably influences the possibility of cooperation.

To many it may appear—putting it mildly—astonishing that in such a narrow sense we have defined physical results, merely as the set of explicitly computed physical quantities, definitely excluding from the notion all the hocus-pocus surrounding these, that is, the very things which either on scientific fora or through scientific propaganda the *scientistæ* [9] com-

[6] Cf. Julius Evola, *The Mystery of Eros—The Metaphysics of Sex*.

[7] Sacred *science* and not religious sentimentalism, since it is also only too common an experience how impotent the latter is against modernity—whenever it does not outright cut a deal with it.

[8] Sharpening the problem to the extreme, we will ask together with the theologian Tibor Imre Baranyi: "... we wonder how anyone would refute an eventual statement that the whole universe bursted into existence quasi one second ago?"

[9] According to the *Oxford Dictionary of English,* a scientist is "a person studying or having expert knowledge of one or more of the natural or physical science". A *scientista* (pl. *scientistæ),* on the other hand, is a person who believes in scientism, i.e. anybody who absolutises modern sciences, their methods, their results; even if only in their legitimate sphere of operation. Obviously, nowadays the majority of the people are *scientistæ,* even those who know hardly anything about science, obtaining only a few crumbs via scientific propaganda (whose very mission, by the way, is the propagation of scientism, displaying the results nearly always as absolute). An example: it is scientism if somebody does not eat something for the reason that "scientists" "have proven" that it is "unhealthy". The problem with this is that from the perspective of modern science it is impossible to seize what health really is; therefore, in the foregoing sentence everything gets upset, so that

municate as results, and they are most proud of. The fact is, however, that everything that goes beyond the mere quantities—the aforesaid mental mechanisms for instance, which commonly correspond to the so-called physical processes—allows for interpretations from alternative viewpoints as well. These alternative interpretations are *a priori* just as legitimate as the scientistic interpretations, even though they be totally alien to this latter viewpoint. Hence, even according to the nowadays general "democratic" paradigm—or meta-narrative, which is considered universally applicable, scientism should not monopolise the right for interpretation, as this paradigm could appear as some "parliament of viewpoints" concept in this domain. The full truth is, however, that the presence or absence of real principles establishes a hierarchy among the viewpoints, and since scientism lacks any such principle, the corresponding viewpoint must be placed to the bottom of this hierarchy, while traditional metaphysics,[10] which is defined as the very repository of these Principles, to the summit of the hierarchy. The only type of results therefore, which is truly inalienable from physics, is the physical quantities as computed results.

all the three pairs of quotation marks are necessary. For the very same reason, after some while, some other thing will be "proven" unhealthy, something that may have been considered expressly healthy so far—and vice versa. (Of course there are unambiguous situations, but therein science hardly plays any role at all.) The example demonstrates that modern man's life is almost completely and increasingly engulfed in scientism, and the makeup and operation of modern societies and states as well.

[10] "Traditional metaphysics" is in fact a pleonasm since there is only one *real* metaphysics, the perennial or traditional, which descended into existence together with Man himself. However, the presence of diverse, either philosophic or vulgar "metaphysicæ", justifies the use of this pleonasm.

II An example

To illustrate the foregoing, let us look at an example: the genesis of one of the most successful physical theories of the 20th century, the modern physics *par excellence,*[11] the so-called quantum mechanics. Probably many are acquainted with the the trivial little anecdote-like story (the likeness of which abounds in the physicist-folklore version of the history of physics), according to which in the late 19th century a young Planck orienting himself towards natural sciences, inquires his high-school teacher as to which field of science to choose. The answer is that anything but physics because therein all but maybe two or three small problems are already solved! And—lo and behold!—precisely from these few unsignificant-looking problems springs forth the whole of 20th-century physics, partly—the point of the anecdote—as the contribution of Planck.

One such problem was the so-called discrete spectrum of gases: the empirical observation in this case was that under appropriate circumstances, excited gases radiate light of certain colours only, instead of a mixture of all colours (approximately white light). Thus, the experimental result is on one hand the fact that the result is a series of numbers, and on the other hand the numbers themselves which constitute the series. Here for the mere possibility of a theoretical-physics description to occur, and for the identification of the parameters of the phenomenon, several layers of working hypotheses have to be put into action. One such hypothesis, already quite natural at the time, was that the gas consists of particles—so-called atoms;[12] the other one, at the time less natural, was that the atom is composed of a so-called nucleus and electrons.

At this point, 19th-century physics can form a further natural hypothesis, namely that since the latter two constituents are so to say electrically charged, they attract each other, and hence arrive at a problem analogous to the planets orbiting the Sun. The parameters are the constituent masses and the strength of attraction. Hereafter, only the machinery of Newtonian mechanics is to be operated, with the addition that due to the electric charge,

[11] Relating to the word "modern" a small usage note will be in order here: the whole of physics is—in the present sense of the word—*modern science.* With this we sometimes contrast *traditional* or, equivalently, *sacred sciences. Modern physics* is, on the other hand, a portion of physics we will define below, which can be contrasted with *classical physics* within physics. For those with ears to hear, already the name of this latter will suggest that it is just as antitraditional as modern physics, and the whole of modern science. The existence of a possible *sacred physics* will be shortly discussed.

[12] As a side remark, let us note how far what *scientistæ* at the time hastily named "atom" is from being the elementary building block of matter—not to mention how the ancient conceived it, as already according to "the present state of knowledge" it has an internal structure of at least three further layers. Naturally, the "atom" as the elementary building block of matter will never be found by modern science since such a thing cannot exist—its existence would be a metaphysical absurdity. The critique of scientific nomenclature could make up for a separate treatise—how the terms are incorrect, misleading, and what their consequences are on scientific mythologies. Such distortions of nomenclature are not incidental, it is very much in the interest of the scientists, since how much better it sounds to say that "we have discovered the atom—conjectured by the ancient Greek", than to say that "well, we have discovered some particles about which we have no real idea what they are, but in a few decades it will anyway turn out that they are not the elementary building blocks of matter". Similar semi-intentional distortions can always be discovered when facing high-sounding terms, and this is necessarily so, if we consider how tight is *in a legitimate sense* the domain of validity of scientistic activity: it cannot have notions and yield results of universal validity.

the motion will also interact with the omnipresent so-called electromagnetic field, and as a consequence of this very interaction, the atom cannot remain stable, and its radiation will comprise all colours. Therefore, the results of the atom-model such conceived and described with the notions and theories of 19th-century physics, contradict the empirical observation.

One of the first proposals for solving this problem is due to Bohr, who founded his atom-model on the following, at the time startling, and completely *ad hoc* hypothesis: the electron cannot orbit the nucleus at an arbitrary distance, only at certain distances, in such a way that the orbits satisfy a certain mathematical condition. This model does not need the above third working hypothesis because that is fully overwritten by the new hypothesis, and yields in a natural way a series of numbers as the colours of radiation. Bohr's atom-model is—putting it mildly—unsatisfactory because on one hand due to its *ad hoc* and very special character, its predictive strength is very little; on the other hand, more precise measurements indicate that the series which it predicts is incorrect.

A fuller solution of these problems—on this level: this was the aim envisaged by Schrödinger, his starting-point being that for the matter waves conjectured by De Broglie in another problem, a wave equation could be set up, and the solution of this would yield the desired result. The wave equation could at the same time support in a natural way Bohr's hypothesis, as the solutions of such equations indeed form sequences under certain conditions (consider only the sequence of harmonics of a string). The appropriate wave equation was found via trial-and-error in such a way that he had successively solved all the equations occurring to him and compared the resulting series with the experimentally measured series.

Inductively generalising the equation found by Schrödinger in this special case and recognising that on this more general level the theory coincides with the so-called matrix-mechanics set up by Heisenberg in other problems, can one arrive at the operator- or quantum mechanics (where the second term is utterly inaccurate), which then contains Bohr's atom-model as a fairly exactly identifiable limiting case. The *ad hoc* character of the generalised Schrödinger equation persists: it is a *postulate* of the theory. The mathematical structure of the theory is herewith basically solid, however, in order that its results can be translated to the language of actual measurable quantities, a series of further postulates must be formed, starting with how to regard that entity—the so-called wave function—to which the equation pertains. The assembly of these further assumptions is commonly called the "interpretation of quantum mechanics", however, this has nothing to do with interpretation as we have outlined above: For these hypotheses are indispensable in order that quantum mechanics can function as physical theory at all, even in the strictest—narrowest, legitimate—sense as we have defined above.

On a higher level, let us note moreover that for example the statement that a gas consists of atoms, remains a *hypothesis* here and all along, even if hundreds of physical theories backed up by millions of measurements rest on this hypothesis. The statement that matter consists of atoms, or any similar statement, can be "proven" by physics only according to this special notion of truth, namely that yes, there are some physical models which rest on this hypothesis, and which—in certain parameter regimes—can properly reproduce results of measurements. — While in other models the atom may not even be definable.

III Physical theories are non-exact

To illuminate what we mean by non-exactness and the levels on which it is manifested, first of all we have to clarify of course what would the *exactness* mean: In the sense in which we wish to apply it here, it is precisely what one would expect, that is, that physical theories are set up in a systematic way, observing mathematical rigour. Why, the foregoing example may have already portended that this is by no means so. The example aptly illustrates at least three levels of the aforesaid non-exactness:

The genesis of physical theories is *heuristic* Even the most successful often remain on this level: Quantum mechanics for example even in its full-fledged form of today, with nearly a hundred years past, is based on several *ad hoc* postulates.[13] In some cases, there are fewer or even only a single postulate, often appearing as a so-called symmetry postulate. This means that the equations of the theory have to remain unchanged when certain entities of the theory undergo a symmetry transformation (reflection, for instance). These symmetries are the deepest "principles" of physics, therefore those theories are regarded as most perfect which can be derived merely by postulating a symmetry. In general, such theories are conceptionally less problematic that those based on several independent and *ad hoc* postulates—even more *ad hoc* than a symmetry postulate, that is. Thus, for instance the so-called special theory of relativity first formulated by Einstein, with the postulate that the speed of light is independent of reference frame, which can also be formulated in the form of a symmetry postulate, is significantly more consistent and fraught with fewer conceptional problems than quantum mechanics.

The mathematical formulation of the theories is undefined From the mathematical point of view, those entities can be considered well-defined and those statements proven which can be traced back to the entities of the so-called set theory, and, respectively, derived from its axioms observing formal logical rigour.[14] We will say that tracing back physical theories to set theory would be a task of such magnitude that for the majority of physicists, the very proposition is a sheer absurdity. Abiding by the foregoing example, if Schrödinger would have also examined what entity the proposed "wave function" is from the set-theory point of view, i.e. in what way it can be defined as a set, and whether the occurring equations

[13] The so-called Copenhagen interpretation of quantum mechanics, though this has nothing to do with "interpretation".

[14] At the dawn of modern mathematics when several branches of mathematics had already unfolded considerably, problems relating to the unification of individual branches and the inner consistency of certain branches arose. It turned out that these problems can be solved if the whole of mathematics gets founded on set theory. This program, which has been running ever since, has the requirement for example that any entity appearing in any branch of mathematics has to be definable as a set. This occasionally renders it rather difficult to define such entities as for example the real numbers, although these had been used routinely (but in this sense in a not-well-defined way) by premodern mathematics, or are used today even by high-school level mathematics. It is remarkable that the only concrete "set" occurring at the outset of this program is the empty set. From this one can construct further, by considering first the one-element set containing the empty set, and then the two-element set containing the latter and the empty set, and so on. Hence, the empty set stands at the depths of all concrete mathematical entities—possibly in infinite instances, this is the ultimate principle of modern mathematics.

are well-defined from the set-theory point of view, and if they are, then whether they have solution in this well-defined sense... Well, in this case Schrödinger would have been unable to solve not only the several occurring equations, but very likely up to this day even the single correct Schrödinger equation.

The attitude of most physicists to this problem is pragmatic to the extreme,[15] which in practice results in a third aspect of physical theories, namely, a set of mathematical interpretation-solution recipes. This accompanies the theories from the outset since without these no result could be achieved at all.

Admittedly, there exists a branch of physics, the so-called mathematical physics whose subject is exactly the precise mathematical formulation of physical theories, but this can be considered marginal at its best as it does not promise engineering applications—an engineer does not need more than a set of recipes anyway. Furthermore, even if we assume that mathematical physics one day, perhaps near the 200th anniversary of the outset of quantum mechanics, will clarify all the related problems, that question still remains open as to why exactly in the language of mathematics—and why *this* very mathematics—can physical models be set up for the empirically observable nature.

The theories are unsolvable ⇀ Here by exact solution we mean that mathematical (even if only the aforementioned recipe-level) methods alone yield the result. In quantum mechanics for instance there are only two problems which are physically relevant and in this sense exactly solvable, one is the so-called harmonic oscillator, and the other one is the very problem set by Schrödinger, the hydrogen atom.[16] The extraordinary scarcity of exact solutions explains that on each of the two problems or rather their solutions, a huge branch of physics is founded, on the first one the so-called field theories, and on the second one atomic physics. We can see therefore how fortunate Schrödinger was since who knows what could not have happened if the given problem for the solution of which the theory is sought, happens to be unsolvable in the given theory!

What in the other cases then, the case of unsolvable problems? Or dare we suggest that for example in quantum mechanics, in this breathtakingly successful physical theory, after solving two problems, the physicists are already at their wit's end? No, this is not exactly the case, but here we are reaching more and more marshy terrain—even more than so far, that is. In such cases, beyond the fundamental hypotheses of the theory, one needs to draw in additional hypotheses, further restricting the original domain of validity of the theory, and hence arrive at a method—basically a new physical theory[17]—in which the given problem becomes solvable.

The arising difficulties are often mind-boggling, and the situation is all the more grave because due to the increased number and undefinedness of the hypotheses, the domain of

[15] From these physicists such romantic-sounding statements are often heard: the mathematician and the physicist relate to each other like the academic linguist, who meticulously polishes, and the poet, who autonomously employs the language. In this case, verily the limit to which something can be regarded as physical theory, fades away, together with the boundaries of the validity of the theories.

[16] In the case of classical physics, i.e. Newtonian dynamical equations, the same two.

[17] Indeed, the theories hence arising are principally, for instance from our present perspective, not much different from the theories they stem from, and they can be indefinitely extensive.

validity of the hence derived so-called approximate theories can be quite difficult to determine. Indeed, as a physicist it is only too common an experience how many mistakes and much confusion may arise from the application of diverse—sometimes mutually exclusive—approximate models in cases when the approximation is rigorously not valid; and in fact we will say that an important aspect of the activity of the physicist is to flounder about on this swamp.

There exists, however, a further possibility since the so-called computer science has worked out methods for tracking or so to say simulating solutions of equations with computers; for the so-called numerical solution of equations. These methods are applicable in an incomparably wider range than the range of exact solutions or approximate theories, the applicability being usually only limited by certain quantitative aspects of the problem, for instance the size in some sense of the system to be described. Since this type of solution naturally gives mere numbers as result, the "possibility of interpretation" can get lost to some extent, but from our perspective this amounts to a mere technical difference between the exact and numerical-solution methods, there is no principal difference. Let us emphasise that the systematic solution of physical theories—which is non-exact solution in the above sense as it relies on computer science instead of mathematics—became possible only with the appearance of computers.

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Now once more shifting to a lower perspective, but still from rather high, we overview the formation of physics up until today, with special emphasis on the transformation of its conceptual makeup and "Weltanschauung".

IV Classical physics

The term classical physics has two meanings, denoting on one hand premodern physics prior to the 20th century, and on the other hand everything that is not quantum. In the latter sense it comprises for example the whole of the so-called theory of relativity.

The most important conceptual feature of classical physics is that it is deterministic, although tracking in any sense the deterministic evolution can be extremely difficult in certain cases. One such case is when the studied system has many constituents—each of them moving deterministically, for instance in the case of the (hypothetical) particles of a gas of even only a relatively small amount. The second such case is that of the so-called chaos theory[18] studying systems in which a small incertitude in the initial condition grows very quickly under time evolution, that is, the quality of results calculated for a given initial condition deteriorates rapidly.[19]

The experience is that most of the relevant problems coming within classical physics belong into at least one of these categories. Into both for example the weather understood in the physical sense, that is, as constituted of fields and currents, whose ultimate modelling extended over the whole globe would be a task of astonishing magnitude indeed.

The two main branches of classical physics are the so-called mechanics studying the motion of bodies and the so-called electrodynamics the dynamics of the hypothetical so-called electromagnetic field. In certain parameter regimes, the light understood in the physical sense, can be described as the classical radiation of the electromagnetic field, hence electrodynamics contains the so-called optics as a limiting case. The other problem of 19th-century physics was that the two branches show discrepancy since they meet two different symmetry conditions. This problem gets resolved by the so-called special theory of relativity, which is therefore indispensable for the inner consistency of classical physics, and which hence unifies the two branches, but only at the price that the whole classical way of describing motion gets replaced by a new one. The theory hence obtained contains classical mechanics as a limiting case.

This new way of describing motion is mildly speaking rather alien to everyday experience as it makes reference to a four-dimensional space where the fourth dimension is time, and a shift from a given reference frame to another corresponds to a rotation in this four-dimensional space. This allows for converting into each other time and space, as a consequence of which time elapses differently in different reference frames. Time however pertains to play a special role due to the special geometry of this four-dimensional space. A mechanism analogous to this converts energy and mass into each other.

Concerning energy, a small excursus will be in order here, on one hand because it possesses a central role in classical physics (as well), and on the other hand because it occupies a nearly absolute position in modern Weltanschauung, and people can be heard referring to it confidently in various contexts. That is why it is important to emphasise that energy as physical notion is altogether hypothetical as many-many levels separate it from direct

[18] Concerning the quality of the term, no comment this time!

[19] Perhaps the most tangible example for such a situation is the starting shot in billiards, where the minutest details of the initial position of the balls may dramatically influence their trajectory.

observability. In a physical Weltanschauung—which may be established hypothetically—it does possess an important role because it is a so-called conserved quantity, meaning that in a stand-alone system whose every parameter is constant in time, the total energy content is constant. Energy then appears as a potentiality which may arbitrarily flow assuming various forms between the components of the system, which is said to be closed in this sense, generating dynamics or—according to the special theory of relativity—even mass. The origin of its importance is therefore that according to physics, many systems can be considered closed, but here a very severe problem arises: Closedness, as the *un*changeability of parameters, is defined as the denial of something, yet, according to the above, physics may not make such a statement. Indeed, in all physical systems assumed closed, there may be open energy-carrying degrees of freedom which are omitted from the description. Absolutising energy in the modern Weltanschauung is therefore illegitimate because the sole reason for this could be the conservation of energy in a given system, but physics is unable to formulate this in a legitimate way. Hence, physical Weltanschauung besides being fully hypothetical, and restricted only to the narrowest domain of reality instead of the whole world, is in addition logically inconsistent.

The special theory of relativity hence unifies mechanics and electrodynamics, and reference frames moving with constant velocity relative to each other. What sticks out from this circle within classical physics, is gravity and reference frames accelerating relative to each other. These two things are unified with each other and with the foregoing by the so-called general theory of relativity set up by Einstein in a fully hypothetical way since at the time no empirical observation was pointing into this direction, as a result of a lengthy theoretical labour. The reason for this was that for the sake of perfect unification the theory had to be founded on a hypothesis which is again very mildly speaking alien to everyday experience: The geometry of physical space, that is, for example, what the straight lines are, becomes dynamical variable, in such a way that the distribution of matter determines geometry, which in turn acts back on the motion of matter. Matter in great mass may significantly curve the straight lines—defined by rays of light, in a limiting case back into themselves as in the appropriate proximity of the so-called black holes, whence therefore there is no way out—not even for light.

V Modern physics

Thus, modern physics in our sense is quantum mechanics and its corollaries. The relation between quantum mechanics and classical physics is mildly speaking unclarified because the former in principle contains classical physics as a limiting case, yet, it cannot be formulated without reference to the latter. This situation is rooted in the Copenhagen postulates of quantum mechanics, namely the definition of the physical content of the wave function and measurement.

According to this, the wave function, to which the fundamental equation of the theory pertains, contains all the information about the system from the quantum-mechanical point of view. It must be regarded as giving the *probabilities* of the possible outcomes of measurements performed on the system, and a measurement is an interaction with a macroscopic object (that is, one described by classical physics), which instantly changes the state of the system, that is, the wave function.

Two very severe problems arise here:

1. It remains completely undefined what is to be considered macroscopic object. Experience shows that everyday macro-world phenomena are well described by classical physics while in the micro-world this is replaced by quantum mechanics, but on what level and how this transition occurs, is not part of the theory.

2. It remains undefined how the change of state inflicted by measurement occurs. In physics, the dynamics of phenomena is one of the main objects of the study, thus the postulate of an instantaneous change of state is quite unusual. Due to the previous problem, however, the theory does not contain the interaction between quantum and classical systems, hence it is obliged to keep quiet about the dynamics of this change.

Now, these trifles have remained unclarified up to this day. Thus, it is especially remarkable, a telling characteristic of the overall mentality of scientism, and an alarming fact at the same time, that such a theory could become astonishingly successful, in an unprecedented way, and it is successful up to this day, even after some hundred years continuously throwing up ever newer and newer whole branches of science. On the level of technology this astonishing career is branded by such infernalities as the so-called nuclear technology, the so-called laser, or the whole of the so-called semiconductor technology. And on the level of interpretations it vindicates itself as the foundation of the observable world since from the universe to the stars to the altogether everyday solid bodies, nothing could be described by physics, if not by means of quantum mechanics.

From the postulates it follows that in quantum mechanics the determinism gets lost since even in full knowledge of the state of the system only the probability of possible measurement outcomes can be calculated. The results hence obtained can therefore be compared only with an experimental *statistics* while the outcome of a *single* experiment cannot be described.

Another problem of quantum mechanics of a more technical nature is that with increasing system size the size of the numerical problem to be solved and hence the computer needed for the solution grows with such a rate, that the complete tracking of the dynamics

of more complex systems, for example even only middle-size atoms is impossible. Thus, although quantum mechanics contains the whole of chemistry as a limiting case, this remains a theoretical potentiality.

The original formulation of quantum mechanics does not refer to the theory of relativity. Its unification with the special theory of relativity can be brought about at the price that the corpuscular description of matter has to be dismissed altogether, postulating so-called quantum fields instead as the fundamental entities of the theory. Particles appear as excitations of these fields in such a way that if the quantum field is pictured as a string then the different particle states correspond to the harmonics of this string. Hence arises an entirely new—and according to the present state ultimate—generation of physical theories, the so-called quantum field theories.

While the conversion between mass and energy remains a theoretical possibility in classical physics, no example can be given for it, in quantum field theories it takes place routinely due to the presence of the so-called antimatter. For antimatter particles may so to say annihilate the corresponding matter particles, during which process a particle-antiparticle pair is converted into radiation energy for a while before a new pair is generated.

By postulating symmetries, quantum field theories can be set up systematically, and such a program has resulted in the ultimate theory of matter according to the present state, the so-called standard model of the so-called particle physics. Its three different sectors are built on three different symmetries, which has been chosen via lengthy trial-and-error in such a way that the theory agree with the experiments. The standard model considers the material world as built from twenty-four kinds of particles, that can interact with three fundamental types of interactions, among which only the electromagnetic interaction can be observed in the macro-world. For a practical operation of the model, about twenty independent parameters are needed which cannot be calculated from any theory: They must be measured first and can be applied afterwards in the model for further calculations. Another blemish of the theory is that it does not contain gravitation as an interaction, whose ultimate theory remains the classical general theory of relativity. This could not be unified with quantum mechanics to this day, it cannot be formulated as a quantum field theory.

Abiding by the above example, we point out that full modelling of even a little complex atom based on the standard model would be a task of astounding magnitude, since practically even the basic properties of the simplest nucleus, the so-called proton, have never been entirely derived from the theory. Thus, in this theory of matter considered most fundamental today, there is no entity which would correspond to the atom of chemists, we are facing here one of the "mental survivors" mentioned by Guénon, which hence propagates through chemistry, molecular biology and the rest into technological application, and through scientific propaganda into common knowledge, while its fundamental structure is completely unclarified, what is more, any striving after this is in fact obsolete.

VI Thermodynamics – statistical physics

From our perspective here, however, the most remarkable physical theory is without doubt the so-called thermodynamics, which we will study together and even confound with the so-called statistical physics, because to some extent they are indeed one, so we would need to go too much into details if we wanted to exactly define the difference and relationship between the two. Thermodynamics is one of the most extraordinary, most astonishing, most abstract, most general, and precisely because of this, according to our viewpoint, the most dangerous physical theories. We will say that it is the darkest, as it engages in masses of compounds bereft of quality. Its subject is the study of *statistical* averages of systems comprising many (ideally infinitely many) identical elements. Its generality is for the very reason that it has in fact only one hypothesis, namely, that the elements are numerous, although what is *enough* can occasionally be quite difficult to verify.

Its central insight is that such systems exhibit universal behaviour, independent of the qualities of the compounds. Due to exactly this, it cannot even be determined whether thermodynamics is classical or modern physical theory, as even this quality of the compounds is to a large extent irrelevant for the description.

Its central notions are the so-called temperature, which can be defined for every such "large" system, and closely related to this the so-called entropy. Entropy is commonly described as the "measure of disorder", but it would perhaps be more appropriate to name it the "measure of the lack of quality". For it relates to the quantity of those microscopic configurations which can realise a given macroscopic state—the latter being defined by its statistical averages. That is, that macroscopic state has higher entropy with which more microscopic configurations are compatible, or for which—to put it in a somewhat absurd way—more vote among the microscopic configurations, which are by the way unimaginably numerous.[20]

Of central significance and general validity is the so-called second law of thermodynamics, which may be formulated in several equivalent ways. According to the formulation most tangible to everyday experience, from a single heat bath no work can be extracted.[21] According to an equivalent formulation, the entropy of a closed system *cannot decrease* under time evolution. Sharpening this statement to the extreme results in the methodology which is to be thanked for the extremely wide-range applicability of thermodynamics: the so-called maximum-entropy methods. The fundamental idea of one of these methods is that in the most various "systems" such processes will take place which allow for maximally intensive "output" of entropy—which at times can be defined only in a quite abstract way. Via

[20] To demonstrate the orders of magnitude in question: when distributing ten "particles" between thirty possible states the number of possible configurations is $2 \cdot 10^{19}$. By contrast, in a gas the order of magnitude of the particle number is 10^{23}, and the number of states can become arbitrarily high with increasing energy. $10^{(10^{10})}$: such powers of powers are typical for the number of configurations.

[21] That is, it will for instance not lift or start moving spontaneously though by decreasing its temperature it could cover the necessary energy from its energy stored as heat. Thus, energy can convert into entropy by heating or exhibiting work, but this energy cannot be regained in the form of work, only by involving another, colder heat bath, hence creating a heat engine.

this method such processes can also be described in which a spontaneous ordering—that is, entropy loss—allows the system for outputting entropy even more efficiently on another channel—for instance in the form of heat. *Ad absurdum:* sometimes it is necessary to order a little but only to be able to make an all the bigger disorder.[22]

We warmly recommend to the reader's attention the fact that the second law is one of the most fundamental physical laws, about which there cannot be the shadow of doubt even, so this is one of the ultimate messages of scientism to humankind.

The notion of entropy is fraught with several paradoxes, the most significant of which is the so-called Gibbs paradox, remarkable for us as well as it aptly characterises the "progress" of physics. Gibbs coined the paradox towards the end of the 19th century and *resolved it immediately*. Surprisingly, this latter fact had been ignored by the posterity for nearly a century, until its reinterpretation by Jaynes. The posterity had instead commonly believed that the paradox can be resolved only by quantum mechanics, which did not exist at the time of Gibbs—the majority believes the same to this day, as Jaynes's work remained practically unnoticed in the dumping of the postmodern era. The explanation of these strange developments can be found in Gibbs's style on one hand, and on the other hand in that the resolution of the paradox necessitates the reinterpretation of entropy in such a way that the amount of information which a given experimenting individual has about the system has to be involved in the definition of entropy. Thus entropy, this extremely important fundamental quantity of thermodynamics, will be different for individuals having different amount of "knowledge"[23] about the system. It may seem therefore that the paradox gets resolved only to be replaced by a new very severe conceptional problem, which latter may be resolved on the plane that the knowledge about the system influences very much the possibility of experiments that can be conducted on the system, and hence for example also the amount of work gained from the system.

[22] It is worthwhile to note that some critics of darwinism often simply claim that "evolution" is absurd as it contradicts the second law of thermodynamics. The situation is unfortunately not that simple, there is no contradiction for two reasons even, on one hand because the systems in which evolution occurs are not closed, and on the other hand because according to the above, spontaneous ordering along certain aspects can take place even in closed systems. However, since darwinism contradicts a lot of things in science and above science as well, it is quite absurd, and the manifestation of the most aggressive materialist naturalism, a man of spiritual orientation has to reject it definitely, of course.

[23] The order of "knowledge" in question here and that this really plays an important role in thermodynamics can be illuminated somewhat by the following simple consideration: On regarding a paradigmatic thermodynamic system, a gas, and assuming—as physics does—that it comprises particles each moving deterministically, then it becomes clear that statistics *a priori* should not even appear in the description. It is also obvious, however, that if the amount of gas is not absolutely negligible, then the particles are so numerous that the initial conditions of the motion cannot be assessed—in many respects not even in principle—neither can the motion in any sense be tracked. In thermodynamic systems, therefore, this decrease of control necessitates the statistical description—in contrast to the above-discussed case of quantum mechanics where statistics is inherent even in full knowledge of the state of the system. Hence, knowledge has to be meant in this sense here, in the sense of the measure of non-decreased-ness of control—a rather low order of knowledge, we might add.

VII Modern physics & spirituality?

We have seen therefore that in its transformation during the 20th century, physics has demolished some preconceptions which are commonly part of a mechanistic, or for an outsider materialistic, or quite generally "scientific" Weltanschauung. This process began with the special theory of relativity, which was compelled to drop the classical hypothesis of the absoluteness of time, while the general theory of relativity was compelled to do the same with respect to the geometry of physical space. Quantum mechanics on one hand dropped determinism, and, on the other hand, with the hypothesis of the wave nature of matter, shook the classical assumption of the corpuscular constitution of matter. This latter was eliminated definitely by quantum field theories, where instead of particles the quantum fields generating them are promoted to absolute status. Finally, with the thermodynamic entropy, the "knowledge" of the individual becomes an integral part of physical description.

Glancing over this process, some come to the conclusion that modern science is maybe breaking out of its original boundaries, from material becoming more and more spiritual. This on one hand makes it a suitable tool in the hands of certain pseudo-scientific, pseudo-spiritual tendencies—and here again a very long list could follow, but this degree of descent we would not even like to begin. On the other hand, it prompts certain people—we may think about the endeavours of David Bohm or Fritjof Capra[24]—to compare physical theories with the doctrines of religions, mostly, as it follows from the nature of such things, Eastern religions.

The above-sketched process of the disintegration of presumed absolutes takes place in the domain of the *interpretation* of the theories, that is, the *altogether unverifiable hypotheses.* Thus, we will by all means allow that on the level of profane philosophy this may raise problems or may have consequences at all. For philosophy is confined to the same level of existence as modern science, its hypotheses are in the same way unverifiable, and its "results", lacking any real consequences, remain in the same way unrealised. This aspect therefore does not interest us in the least, since our perspectives are higher by far than those of profane philosophy.

On the level of traditional metaphysics, that is, real spirituality, and its reflections, the orthodox religions, however, this is not possible, and the reason is simply that higher cannot stem from lower, only vice versa. And physics stems from the strictly materialistic order, and the conceptual foundations of the theories can in the best case be characterised by the metaphor of a "swamp".[25] More generally, quoting an inspired man we will state that "nothing that is established from below will afterwards be able to truly engage the spiritual, the order of perennial values". As we have already alluded, the *scientista*—as *scientista*—naturally ignores the very existence of such an order since modern science does not expose its own lim-

[24] A good example for the order of magnitude of errors that can be committed here is the title of a book co-authored by Capra—*Belonging to the Universe: Explorations on the Frontiers of Science and Spirituality*: Well, modern science and spirituality do not share a frontier, just like for instance Earth and Heaven do not, as this would be possible only if the two stood on the same plane of the hierarchically layered existence.

[25] Or putting this somewhat sarcastically: no castle may be built from dung...

itations. In contrast to all what moderns think about knowledge, knowledge of this order is such that nothing—absolutely nothing!—can be seized from it without it "appearing as penetrating the whole being of man, with impact on his existence and way of life as well".[26]

According to traditional doctrines, the ultimate goal of all existence is to allude as symbol to realities of higher order in the hierarchical manifestation. Every manifested being is a symbol, if it was not a symbol, it could not exist. Therefore, concerning the qualities, entities, processes, etc. arising in science the correct formulation of the question would be "what does it symbolise", or what is equivalent "what can I learn via it about the true I-self". This could form the basis of a sacred physics, which should obviously be studied in a quite different way than the profanes do with their profane science.

To conclude this section we will somewhat lengthily quote Julius Evola, who, in the extremely concise and apt manner which is so characteristic of him, summarizes what we have been expounding so far:

> "This, then, is the state of the affairs: Modern science has lead to a prodigious increase of information about phenomena in formerly unexplored or neglected fields, but in so doing it has not brought man any closer to the depths of reality, but has rather distanced and estranged him from them; and what nature 'really' is, according to science, escapes any concrete intuition. From this point of view, the [20th-century] science has no advantage over the earlier [...] science. The atoms of yesteryear and the mechanistic conception of the universe at least allowed one to represent something, in however primitive fashion; but the entities of the [20th-century] mathematical physics serve to represent absolutely nothing. They are simply the stitches of a net that has been fabricated and perfected not for the sake of knowing in a concrete, intuitive, and living sense—the only sense that would matter to an undegenerate humanity—but in order to gain an ever greater power, yet still an external one, over nature, whose depths remain closed to man and as mysterious as ever. [...]
>
> I will repeat that it is a fraud to speak of a spiritual value in today's science, just because instead of matter, it talks about energy, or because it sees mass as 'coagulated radiations' or a sort of 'congealed light', and because it considers spaces of more than three dimensions. None of that has any existence outside the theories of specialists in purely abstract mathematical notions. When these notions are substituted for those of earlier physics, they still change nothing of modern man's effective experience of the world. This substitution of one hypothesis for another does not concern real existence, but only interests minds given to pointless divagations. After it has been said that energy, not matter, exists, that we live not in a Euclidean, three-dimensional space but in a curved space of four or more dimensions, and so forth, things remain as they were; my actual experience has not changed a whit, and the significance of what I see—light, the Sun, fire, seas, sky, flowering plants, dying beings—the ultimate significance of every process and phenomenon is no more transparent to me. One cannot begin to speak of transcendence, of a deepened knowledge in spiritual or truly intellectual terms. One can only speak of a quantitative extension of notions about other sectors of the external world, which aside from practical utility has only a curiosity value."[27]

[26] A glaring instance for the elusiveness of this order of knowledge is the sleep-walking of the majority of orientalists in the East, cf. René Guénon, *Introduction to the Study of the Hindu Doctrines.* The same mentality results in the misconception according to which the goal of alchemy is to transform base metals into gold.

[27] Julius Evola: *Ride the Tiger—A Survival Manual for the Aristocrats of the Soul,* Chapter 20.

VIII Postmodern physics & its community aspects

How to define and since when to reckon the postmodern era of physics, we will not study here with full rigour, but we will say that it is certainly hallmarked by such inventions as the so-called laser for instance,[28] that is, inventions that can be applied almost directly in engineering. One of the characteristics defining the era is precisely that the frontier between physical and engineering sciences is fading away. The other characteristic is that scientism cannot be separated from its social aspect anymore, it lives in a perfect symbiosis with the social structure that is generated by it and sustains it at the same time. One reason for this is of course the well-known ever faster exhaustion of technologies,[29] and the other is that society expects from modern science the solution of certain problems menacing its survival.[30]

Accordingly, if we now adopt the most peripheral viewpoint that we still consider worthwhile in any respect at all, that is, the perspective of a 19th-century – early-20th-century physicist,[31] then the most striking phenomenon is the astounding inflation of physics, in every respect. According to a higher viewpoint we are of course not in the least surprised by the quantitative aspect gaining ground in this field as well, since why exactly this would be spared by the "reign of quantity"? According to the just mentioned viewpoint, however, we deem it worthwhile to abide somewhat by this point, since we are convinced that this will lead to the disintegration of "science" in this sense.

Indeed, for the above reasons, or generally because of its astonishing usefulness, governments, and even those of mediocre operating efficiency, lay a huge stress on the promotion of scientific activity (so much, that this often becomes a measure of the quality of governments). Recently, states from the third world have also joined this tendency, where in the last decades "research groups" of ever dwindling quality have proliferated. Due to the increased attention and resource requirement, there is a strong demand on controlling quality and productivity. This is however not so easy at all, on one hand because the activity pursued here is inherently difficult to judge on a quantitative basis, and on the other hand because the ignorance of outsiders and the deliberate bombast of scientists, make it difficult for the

[28] In an excursion towards symbolology we will note the following: The colour (frequency) of laser light is one of the most precisely controllable physical quantities today. In the laser therefore, such a desecrated light is realised from which all qualitative determinations are expelled gradually. If light is the symbol of intellect, the spiritual omni-possibility, then the laser is an absolute relativisation of this, in analogy with how gold, which is itself a solar symbol, degenerated to modern money, which is pure quantity. It is remarkable that with the desecrated laser-light the dark abyss of the "structure of matter" can be "illuminated" more effectively than ever seen before. It is no coincidence, moreover, that the appearance of laser has hallmarked an era which witnesses the ultimate specialisation, inflation, and fragmentation of "scientific knowledge".

[29] We will note nevertheless that these "*in reality* almost never exhaust, their exhaustion-obsolescence is merely—but with low intent—put across people. This is so with basically all technological achievements." Hence, we are again facing one of the modern suggestions here.

[30] In the light of the foregoing, it may be clear that such an expectation is altogether vain, as the crisis of modern world is a crisis of orders of existence, and any endeavour trying to solve this on the mere material level cannot but increase the fragmentation and vulnerability of the world. Cf. René Guénon, *The Crisis of the Modern World*

[31] About postmodern physics, we could not even say anything new from a higher perspective, of course, which is suggested already by its name, i.e. that it is defined from modernity via a further determination.

former to get an insight into the real processes.

The appearance of the most block-headed quantitative criteria has lead to the situation that nowadays it does not pay off to pursue "difficult" problems. It is an everyday experience that there are lots of fundamental unsolved problems in the theories, but nobody really harps on these as that would ruin productivity, it is simpler to accept the theories as given, and rather continue scratching about within their premises. The aforementioned inflation is therefore penetrating every modality of science: what can be considered physics and physical knowledge, who can be considered physicist, and what should be adequately the activity of a physicist. Just to mention an example, divergence and specialisation is of such magnitude that those are considered the greatest "results" today when somebody manages in some sense to bridge two branches of science.

We will say that many perceive this ever worsening crisis within physics, but that romantic idea is very deeply rooted, according to which physics is a pure or even noble discipline, which however is used by some for their own ends, or even outright for evil. This concept is erroneous on two levels even, on one hand because physics is not a discipline in the original sense of the word,[32] and on the other hand because the present situation is very much inherent in the nature of modern science, what we see here is merely that certain processes that have been running virtually for centuries have started to arrive at a boiling point.

✠

Concerning the inner formation of postmodern physics, we highlight only two branches which in the light of the foregoing may be worthy of attention:

Firstly, in the era, quantum mechanics reaches the level of direct engineering exploitation. Hence, there is a huge demand on numerical solutions in quantum mechanics, which however encounter the aforementioned fundamental obstacles on classical computers. There is a huge interest therefore towards constructing a fundamentally different, so-called quantum computer or universal quantum simulator. We encounter here a good example of the inflation, because this interest is of such magnitude that it alone vindicates any experiment aiming at more perfect control of quantum systems, or corresponding theoretical inventions; but the question whether overall this leads to somewhere even only in the "conventional" scientistic sense, cannot really arise anymore.

In the background of the other such branch is that in the late 20th century, fired by the success and generality of thermodynamics – statistical physics, the question could naturally arise as to—if the only criterion for their applicability is that the system comprise many identical constituents—not exactly such are certain sociological systems, *ad absurdum* the whole human society itself? Well, to this question even from our perspective the answer should be all but: yes, in the terminal phase of the Dark Age the human "society" is indeed such a "system"... but with this statement we would verge on blasphemy. Accordingly, there is an ever growing inflow of thermodynamics – statistical physics into domains which previously constituted the subject of a less quantitative "economics" or "sociology" or even domains that were so far inaccessible for scientism, and hence the bastard named "socio-

[32] Since disciplines in the original sense are sacred Self-realisation, Self-retrieving paths or in some sense even techniques.

physics" is born. What we see here is that certain quantitative aspects of completely undominated phenomena (for instance, how much we are winning on stock market today) can be modelled or perhaps even influenced in the form of—we will confidently put it this way—a counter-domination or counter-tiger-riding, whose starting-point is that the phenomena to be dominated are collective phenomena of a "system" comprising many identical constituents.

For our exposition hitherto, it has been sufficient to mention only the most obvious propellant of physical research, the applications in engineering, that is, whose aim is on one hand to "solve" problems the majority of which was created by modernity itself in former periods, and on the other hand to flood the world with billiards of increasingly insipid consumer goods. It is obvious, however, that not all heavily funded research directions fit in this circle, moreover, such a simplification would be exceedingly naive as to the workings of modernity. In reality, no less important is the kind of research which aims at the formation and solidification of the Weltanschauung whose fundamental concept is that the Earth, mankind, or man is in every respect, regarding space, time, and the structure of matter, no more than a grain of dust in the "universe". The more detailed investigation of this could form the topic of a separate study, here we will merely note that the reflection of such a Weltanschauung in the earthly-human world is exactly the globalised world of today devoid of any veritable centre.

IX Some conclusions

The present treatise had a twofold aim: On one hand, for a contemporary intellectual elite in the Guénonian sense, we wished to expose certain main streams, elements, or characteristics which can help to a fuller evaluation of physical "results", their permeation through the world, and the corruption of existence emerging partly from this process—an evaluation according to the highest and at the same time most profound, moreover unchanging and perennial, that is, the traditional metaphysical perspective. The actual evaluation is then a task of much greater magnitude of course, but so peripheral that it probably does not even worth the effort. We undertook this despite being more than aware on one hand that looking back down from the summit, the whole modern science at best appears as pathetic fumbling in the dark abyss or as "tinkering with *māyā*", and as such it can be swept aside in a flick, together with all diabolic machinations.[33] On the other hand, we are also aware that even thinkers of true spiritual orientation are not always at the level where this could be done with full confidence, meaning probably that they have not (yet) reached this summit. In such cases another, more concrete aspect surfaces, namely that scientism is the harvest from the forbidden tree,[34] which institutionalising has become the basis of a whole civilisation, claiming absolute position for itself, and vindicating itself as the peak of human intellect, which makes it a combatant enemy of real intellect. The present treatise can therefore also be considered a more detailed report on the nature of the enemy, and its present status.

And on the other hand, if some *scientistæ,* perhaps ones who perceive the ever more quickly increasing crisis of modernity either within modern science or without, are induced by the present treatise to start looking in the right direction for alternative, its writing has already availed.

Forestalling some trivial objections and summarising our position[35] we will declare: No, we certainly do not deny that modern sciences have achieved results, and that according to some special notion of truth these results have truth in them, and they are even very significant along certain directions. However—and now not even considering the otherwise probably most important problem as to what the price was, on a spiritual level for instance, to pay for these results[36]—twelve years for an intellectual man is more than enough to realise that the topic, theme, concepts, results, and quite generally all entities of modern sciences are so peripheral that they are in fact already non-existent, and hence their pursuit is a non-intellectual and oftentimes even outright Antichristly activity.[37] Or more explicitly: scientism is a *sect* comprising even counter-initiatic tendencies, modern science is a *counter-*

[33] As in Hamvas's greatest novel, the *Carnival,* in the other-world episode Henoch titles the devil a "pathetic rascal".

[34] Cf. also our treatise "Materia Magica"

[35] For further refinements, the best reference is René Guénon, *The Reign of Quantity & the Signs of the Times;* furthermore, by today there is a large corpus of works by traditional thinkers on modern science and its relation to Tradition.

[36] Generally, for example, what Guénon calls the "solidification of the world".

[37] Only as a very specific infernal image, we can picture for instance the so-called particle accelerator tunnel of CERN of a length of several tens of kilometres at a temperature of minus two hundred and seventy degrees, dug deeply in earth, and emitting deadly radiation all along its length.

knowledge, and its miscreation, modern technology, is a *counter-realisation*—exploitation for petty ends.

However, the most important in our position is this: There is and has always been alternative, and since here "alternative" means not that this intellectual possibility is *against* but that it is strictly *above* scientism, this alternative in spite of all contrary suggestions is just as valid today as it has always been valid. For this very reason, as some have already written it before us, even in spite of all its clumsiness, modern science would not be very problematic if it limited itself to what it is suited for—that is, if it did not exhibit the marked diabolic tendency; and one of our further aims was precisely to sketch its legitimate boundaries. Obviously, in this case it could not have seized the position it usurps in the human world of our age.

On considering its legitimate domain does it become even clearer that physical theories do not have any real explanatory potential. Indeed, what kind of explanation of a phenomenon is it if some related quantities measured in experiments—which again involve hosts of working hypotheses, can be calculated by postulating certain hypotheses? In such cases, the question of course arises as to why *that* must be so then, which in turn leads to the ever increasing divergence of the directions of scientific "research". In the above sections about the formation of physics, we saw that in the succession of theories, the succeeding theory in principle contains the succeeded theory as a limiting case, but this descent cannot be tracked, and likewise the frontiers between the theories cannot be defined. The result is an utterly fragmented "description" of even that plane of reality which falls within the horizon of physical sciences, where the individual sherds of this pile of fragments are crumbling away as well.

The reader may have also noticed that as a scientific counter-propaganda of sorts, we also resolutely aimed at displaying some preposterous features which are commonly not emphasised in connection with modern science, exposing in this way what intellectual *niveau* it in fact represents, and that scientism is a belief, and what it is in fact that the *scientistæ* believe in.

Obviously, everything we have said about physics here, pertains to an even greater extent to other "fields of science", since these define themselves as originating from physics, in principle at least, and hence they inherit its conceptual foundations. However, as their subjects are even more particular than that of physics, often even these not exactly solid foundations are obscured by the ever increasing mass of information piled upon them.

An example will aptly illustrate the thorough impotency of these fields of science, which is the more glaring, the higher the order of existence which constitutes the subject of the study: Fired by the recent "progress" of the devices of the so-called analytical chemistry, a research direction emerged aiming at the "reevaluation" on a scientistic basis of medical herbs and their effects that have traditionally been known from time immemorial. The starting-point is the hypothesis that medical herbs contain so-called molecules, which similarly to the molecules of medicaments, exhibit their effect on this molecular level in the "organism"—which is also assumed to be operated by molecular-level machinery. In this case, however, scientism encounters a mind-boggling multitude of the hypothesised molecules, which multitude—can it be ordered at all—constitutes multiply (infinitely?) layered structures, in the course of the successive unstitching of which the effect gets reversed repeatedly. What

is more, external conditions whose number is also infinite, may influence all this substantially... By contrast, in the traditional science of healing both the maladies and the medical herbs, or even the conditions of their picking and consumption, are symbols of higher realities, and the effect is exhibited via correspondences in this symbolic plane. Thus, contrary to the scientistic divergence, we see a convergence here, which allows for ever more certain knowledge.

The impotency is similarly glaring in the case of living nature for instance, for the genesis of which all scientism can offer is evolution as the only explanation—which is hence to be defended tooth and nail. We could also mention the case of human beings, although, admittedly, during modern times, man has gone a long way in order to fit the scientistic man-view.

Contrasts similar to the above-illustrated can also be discovered between traditional astrology and modern astronomy,[38] or traditional alchemy and modern chemistry,[39] with the addition that here even in the articulation of goals, there are the differences between orders of existence between the two kinds of sciences, provided that apart from the vain piling of information scientism can articulate any goals at all. In spite of all this, however, *scientistæ* to be sure do not hesitate in regarding themselves as true successors of the masters of the corresponding traditional sciences since in modern man the urge for self-justification is very strong. In this we cannot see anything else than a symptom that one feels very much that something very important was sometime lost here, but hardly anybody remembers anymore what that something is.[40]

Did now the objection arise that if we have stripped science of the attributes of a "romantic quest" undertaken by self-denying scientists for the sake of the whole mankind, and we have even endowed it with the attributes of a counter-quest, scientific activity can nevertheless still remain a good game, and why we do not at least let them play unperturbed. Our answer would be that this is of course a private affair of each, we would nevertheless draw their attention to that this activity even in this seemingly innocent form may easily become the "science" of losing Ourselves. The most striking evidence for this is obtained when we examine what kind of people the allegedly great scientists are, or generally those who sacrificed most of their lives for this sake. Well, in the cases when we can indeed presume full honest intentions, we encounter *children,* at best good and kind children, but generally rather aggressive, evil, resentful, undisciplined, and hysterical children. By the way, in the postmodern era this innocence, which should perhaps be more appropriately termed "sinful naivety", can in most cases be taken for granted, since the brainwashing of long-long years, decades, or on the collective level even centuries for the sake of indoctrinating scientism, did not remain without effect. More generally, we will say quoting an inspired man that postmodern man is in fact already "beneath crisis".

In spite of all this, perhaps ever fewer still cherish the illusion today that modern world

[38] Cf. Titus Burckhardt, *Mystical Astrology according to Ibn 'Arabī*

[39] Cf. Julius Evola, *The Hermetic Tradition: Symbols and Teachings of the Royal Art* and Titus Burckhardt, *Alchemy—Science of the Cosmos, Science of the Soul*

[40] Another symptom of the same is for instance the enthrallment by the exotic.

is the world of peace, harmony, prosperity on all the levels of existence, and with scientism witnessing the crowning of intellect; and what we did here was to treacherously attack this paradisiacal world or one of its main achievements and propellants. The situation is of course the very contrary, that is, that modern world practically since its outset, has been gravitating through ever more severe crises into the abyss, but before crashing over the infernal floor of the absolute hegemony of quantity as the terminus of human history, it systematically exterminates the relics of the reign of quality, which it comes upon at any point of the Earth in the world of the 21st century.

X Epilogue

We have thus accomplished our descent into the depths of the counter-Babelic-Tower of our age, being built downwards with the mobilisation of colossal resources, modern science, where we have found the great emptiness, the same that we find in the depths of the modern world, with which they generate each other in a diabolic symbiosis.

As a final word for the ever more numerous and ever more successful physicists and modern scientists of our age and all ages to come, we send the following message:

Just continue toiling away all unperturbed, with heart and soul, sacrificing your whole lives, and bringing all your creativity and other pseudo-intellectual capacities to bear; and then enjoy *the bearing of your work, the newer-by-one-generation hospitals, vehicles, communication devices, and computers; but* dread *the bearing of your work, the newer-by-one-generation dictatorships, mass-destruction weapons, terror devices, and poisons disguised as foods, for this you have born onto the world, and this will be your world.*

And our unchangeable, serene and perennial, luminous world—you cannot touch anyway.