

# ON THE UNIFICATION OF THE REAL SCIENCES. APPROACH B: THE USE OF THE EXTENDED EVOLUTIONARY VIEW<sup>1</sup>

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## ОБ УНИФИКАЦИИ РЕАЛЬНЫХ НАУК. ПОДХОД Б: ПРИМЕНЕНИЕ РАСШИРЕННОГО ЭВОЛЮЦИОННОГО ВЗГЛЯДА

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On the one hand, evolutionary theory forces the abandonment of the seven-day creation of objects and the historical rationale for order in nature. This was the central challenge to Bohr and Einstein in their debate. On the other hand, the theory of evolution assumes a single non-preordained development from the most fundamental physical to the highly complex present-day processes. This justifies the search for a unification of all theories, Einstein's central but unattained goal. He had hoped to be able to derive the unification of all theories from the empirically determined regularities of the physical theories. Until today, however, neither the unification of the physical forces nor the bridge between RT and quantum physics has succeeded. With the Nobel Prize in Physics 2022, Schrödinger's position was corroborated at a special application, according to which entanglement is THE characteristic of all quantum processes. This raises the question of the nature of nature and its evolutionary dynamics from a fundamentally new perspective. With the «Extended View» a unifying framework is available for methodologically different but for health and sustainability irreplaceable theories, in which the different paradigms can be integrated like subsets in a basic set. Starting points are also the non-determined evolutionary process and its partial explorability. The demands on the actors at the beginning of this process were derived from the need for explanation, which arises from the present conditions. It turns out that the characteristics required by Schrödinger were already considered in this approach for reasons of the epistemology used. Approach B attempts to clarify the questions that had to be left open in Approach A despite the expansion of knowledge thanks to the work now honored with the Nobel Prize and further cosmological knowledge gained after Einstein's death.

*Keywords: Big Bang, Evolution, Culture, unification of sciences, health, prevention, sustainability, individuality, Darwin, Sechenov, Extended View*

С одной стороны, эволюционная теория заставляет отказаться от семидневного творения объектов и исторического обоснования порядка в природе. В этом заключался главный вызов Бору и Эйнштейну в их дискуссии. С другой стороны, теория эволюции предполагает единое, не предначертанное заранее развитие от самых фундаментальных физических до очень сложных современных процессов. Это оправдывает поиск объединения всех теорий — главную, но недостижимую цель Эйнштейна. Он надеялся, что объединение всех теорий удастся вывести за эмпирически установленные закономерности физических теорий. Однако до сих пор не удалось ни объединить физические силы, ни перекинуть мост между физикой теории относительности и квантовой физикой. Нобелевская премия по физике 2022 г. подтвердила положение Шредингера в специальном приложении, согласно которому запутанность является САМОЙ характерной чертой всех квантовых процессов. Это ставит вопрос о сущности природы и ее эволюционной динамике в принципиально новом ракурсе. В рамках «расширенного взгляда» для методологически различных, но незаменимых для здоровья и устойчивого развития теорий появляется объединяющая основа, в которую различные парадигмы могут быть интегрированы как подмножества в базовое множество. Отправными точками также являются недетерминированность эволюционного процесса и его частичная (неполная) исследуемость. Требования к «участникам» эволюционного процесса на начальных этапах вытекали из их потребностей и сложившихся условий. Получается, что характеристики, требуемые Шредингером, уже были учтены в этом подходе в силу используемой эпистемологии. Во второй части нашей работы (подход Б) делается попытка прояснить вопросы, которые пришлось оставить открытыми в подходе А, несмотря на расширение знаний благодаря работам, отмеченным сейчас Нобелевской премией, и дальнейшим космологическим знаниям, полученным после смерти Эйнштейна.

*Ключевые слова: Большой взрыв, эволюция, культура, объединение наук, здоровье, профилактика, устойчивость, индивидуальность, Дарвин, Сеченов, расширенный взгляд*

### Starting Point

The acceptance of a single evolutionary process from the beginning of the universe to the present day has not only disproved the centuries-old doctrine that all objects and process principles were created in Seven Days,

but has also provided the justification to search for a starting theory from which all theories, including those for life, society, and culture, must be derivable.

*Einstein's mathematically dominated approach*

Einstein believed that one must arrive at this «mother of all theories» if one succeeded in «achieving complete-

<sup>1</sup> Dedicated to Prof. Dr. Matt Larsson, Department of Physics, Stockholm University.

ness.» By this he meant that all quantities used in the formulas of physical processes could be derived from a common world view and its principles and expressed in formulas. He did not succeed in developing this «General Field Theory». Moreover, he had to admit in his last lecture that also the General Theory of Relativity did not correspond to the self-imposed demand for «completeness», because in it the mass «like the wooden nose of a snowman» was not derivable from the principles of his world view [31].

Einstein had bound himself with his epistemological method to regard as real only that for which there is sufficient empirical evidence. This contradicts the hypothetical realism used by him. This is used to get knowledge for a state, which cannot be investigated at present, but the precondition for it was, that the current situation could be developed from the previous state to be investigated. Einstein used the technique even more challenging: He assumed that there must have been a previous state without electromagnetic fields and particles, but with energetic fields, whose formulas must be able to replace two irreplaceable but mathematically incompatible theories (electromagnetism and mechanics). This he succeeded with the SRT. It would have been legitimate therefore to postulate the existence of the energetic field as a precursor of the electromagnetic field at least. He did not do this, possibly because in 1905 there were no empirical facts for the usefulness of the energetic field independently electromagnetic and mechanical effects. But this had changed in 1919. The empirical measurements made by Eddington of the diffraction of the light when passing the sun and their comparison with the predictions according to Newton and the general relativity theory were an experimentum crucis for the usefulness of the energetic field. But Einstein continued to insist that the electromagnetic field was the starting point for cosmological dynamics, but also for the unification of all theories in his «General Field Theory».

Einstein later realized that the unification of theories can not be achieved even in physics with the help of additional mathematical variables. Kumar insinuates that he came to the view that something more radical was needed («I firmly believe [in the objective world], but I hope that someone will discover a more realistic way, or rather a more tangible basis, than it has been my lot to find.» [Einstein 1944 to Max Born, [23].

#### *Schrödinger's dream*

Schrödinger also dreamed of a unification of physics that was connectable to models of life and culture. Like Einstein, he was a realist and was very critical of Bohr's world of thought. But he did not present his own model for it. In 1925, he did not even want to have to «sit in judgment over which of the two is closer to the deepest truth, Fechner or the bankrupts of modern rationalism» [25]. However, with his fundamental publication of 1935 [26], whose positions were corroborated by the Nobel Prize in 2022, he presented a position on the essence of the micro-world, which threw light on evolutionary aspects which had to appear to Einstein «as spooky remote effects»

according to the facts available to him throughout his life. Schrödinger had predicted that in the experiments with photons assumed by Einstein an entanglement<sup>o</sup> would occur which would lead to a superluminal (nonlocal) observability [8]. Moreover, entanglement is THE characteristic of quantum objects and thus not e.g. their locality. Thus he opens a new view on the microworld.

#### *The heuristic<sup>o</sup> approach A*

Entanglement and nonlocality are not considered in Einstein's model of the real world, neither the energetic field nor the proposal, taken up by Heisenberg in 1955 [13], proposed by Bohr in 1924 [1] but then abandoned, to grant potentia in the sense of Aristotle to the objects of the microworld. Thus the quantum objects would have the possibility of active free decisions within limits. Along with the acceptance of the freedom of choice, the former absurdity of the microworld was solved for Heisenberg.

In approach A Einstein's technique was applied, which he used for the development of the SRT, but also the energetic field as evolutionary precursor of the electromagnetic field as well as other findings gained by physicists after Einstein's death were considered. Moreover, in the sense of Heisenberg, quantum objects were also assumed to have potentia, but only in a heuristic sense. That is, the agents were only imputed to have chosen the outcome that occurred. However, since the agents' potentia were not precisely defined, it cannot be inferred why these outcomes occurred.

The thus extended approach A provided additional insights into the possible course of the cosmological and other physical processes. However, the sought unification could not be achieved. In particular, the bridge between the physical-cosmological evolution and the biologically and culturally achieved evolutionary levels was missing for this purpose.

#### *An alternative approach*

A unifying approach to the different scientific disciplines is also the goal of the «Extended View». However, the «Extended View» has so far been oriented only toward linking the disciplines that are irreplaceable for comprehensive health and sustainability. The hope to be able to derive a common world view with principles for the actors and their processes, in which the paradigms of the most different, methodically currently often excluding disciplines can be integrated like subsets into a basic set, results from the fact that all disciplines indispensable for health and sustainability accept that their research objects and processes are expressions of a single, not predetermined evolutionary process.

Therefore, one is in consensus with all disciplines concerned if one starts from the currently reached state and deduces what one has to impute to the most fundamental actors that caused the scientifically most distant process, i.e. the Big Bang, so that they could become the starting point of this evolutionary process until today. However, it is always only about the general principles and not about the con-

crete conversion into the special action instructions of the individual disciplines. Only the experts of these disciplines are technically responsible for this. But everyone is «responsible» for the general principles of the «world view».

The approach to the starting point of the process, chosen in the Extended View, does start from statements about the Big Bang, like the one of Einstein. However, it differs radically from Einstein's. The starting point is not the available physical formulas, but hypothetical assumptions for the characteristics that must be assumed for the initial actors that brought about the Big Bang, so that life today becomes intelligible as a consequence of the evolutionary process.

Nevertheless, Einstein's approach was essential in many ways to the elaboration of the Extended View. This concerns e.g. the technique developed by him to derive assumptions for the evolutionary prior state from given facts. For this, we refer to his so-called principle theories in the Supplement<sup>2</sup>. To him also important possibilities are owed, how the question can be narrowed down. This will be discussed below. The now demanded application of the model developed for health and sustainability to a quite different special field, namely the field of tension between micro and macro world, does not only represent a test of the used transferability of the Extended View. Approach B is also associated with the hope of finding extensions in the understanding of processes in general.

### A Brief Introduction to the Extended View

Assuming a single evolutionary process, everything that can be observed today must be due to modifications of the initial characteristics of the actors that led to the Big Bang process. Others were not there. They are assumed to have *potentia* in the sense of Aristotle (see approach A). What this must comprise concretely, so that the complex today's events from consequence of a not predetermined evolutionary process become insightful, was derived in an analysis of today's events.

The decisive point is that the starting point of every evolutionary process is individual cases. One or individual creatives use possibilities of the previous state to successfully implement the new, others are individually ready to adopt the new. Then the evolutionary new has persisted out of self-interest and therefore unintentionally. The evolutionary process was thus the unintended, inevitable result of individually intended goals.

To understand this process, one must put oneself into the viewpoints of the actor who had these goals (Special Extended View) and not only consider the general result. But the scientist gets only this general result, if he tries to understand as far as possible without influencing the happening from outside, so to speak as an unnoticed wall-shower the large generalizable connection (General

Extended View). Therefore these two approaches provide the basis for the Applied Extended View. In this, the application-oriented subject-specific principles are worked out for the targeted scientific field, i.e. primarily for «physiology in the sense of Alfred Nobel» [19] or now also for the relation micro-world-macro-world. The fourth stage of the Extended View then deals with concrete guidance for action, e.g. for social medicine, PH or comprehensive sustainability. An introduction to this can be found in the Open Lecture Series of Sechenov University [20] or in the teaching material of the University of Innsbruck [15].

### Methodological guidelines and their implementation.

Any scientific activity that deals with the interrelationships in nature and our everyday life also needs foundations for its methodological approach, however significant the empirical investigations may be. «Science without epistemology is — if it is conceivable at all — primitive and confused» my Einstein. Because the «theory determines, what one can observe (Einstein), what one cannot observe (Heisenberg) but also, which conclusions one may draw from phenomena and how one must formulate them, in order to be able to remain a member of a scientific community. So that nevertheless the observation facts remain determining, the theory should be adapted continuously to the gains of observation facts, as Einstein implemented this consistently.

*Primum non nocere — «as if».*

Models for medicine must satisfy the principle of Hippocrates: *Primum non nocere*. (*secundum cavere, tertium sanare*) Harm must be avoided (then prevention is needed and thirdly therapy). Therefore, the Extended View had to be structured in such a way that — regardless of its philosophical correctness — irreplaceable application possibilities can still be used.

In this context, reference can be made to Einstein's findings: He could prove, for example, that there is no passive, but only active, individually directed motion in physics. However, he refused to see this as a falsification of e.g. Newton's classical physics, although this model assumes passive, forcible, generally determined processes. This can be interpreted in such a way that the evolutionary process from a stage in which there were no electromagnetic fields and no particles and which therefore must be treated with the help of the SRT, has led to the stage which can be successfully covered with Newton, in such a way that the gain by the SRT is *de facto* negligible. Therefore one should continue to use «Newton» in classical questions. One would have to be clear only of the simplification and to consider this in the world view. So there can be no machine model in nature, although it is sufficient to proceed «as if there would be passive motion». «As if» helps also e.g. with the understanding «as if an electromagnetic field had the mass  $h\nu/c^2$  etc.»

<sup>2</sup> Topics that are dealt with in more detail in the supplement are marked with the symbol °. The supplement also contains an explanation of the content of the section marked with °.

Thus, the gain of a unification is not to improve existing possibilities of statements, but to be able to ask questions which could not even be formulated so far and to be able to answer questions which seem to be unanswerable so far.

*Incompatible is not compatible — «not explainable so far».*

It is demanded that secured application-oriented knowledge of the sectoral disciplines is to be accepted within the model, or only modified by the subject-specific experts. This means that natural scientists must not question what was already indisputable for Descartes: That in their essence fundamentally different things cannot interact with each other. As is well known, Descartes started from two substances: the *res extensa*, which was subject to the inevitable divine laws, and the *res cogitans*, which enabled logical weighing and therefore the freedom to sin. For its realization it needed the *Res extensa*. Therefore, he had to postulate that God sits in the pineal gland of man and there, with his omnipotence, enables the individual to decide for or against sin and then acts accordingly. Such arguments are inadmissible in the Extended View. If reproducible phenomena occur which cannot be explained with the available scientific instruments, they are called «not explainable so far». This would be the adequate wording e. g. to the fact of the indeterminacy of the individual case, the quantum randomness as an independent causer of physical effects without being a quantum object itself, because «quantum randomness» is not the name of a quantum object.

*Linguistics, mathematics,  
philosophy etc. as auxiliary sciences*

Einstein pointed out years before the linguists [2] that words, numbers, formulas etc. are only free inventions of the human mind which help us to deal more successfully with the world. These inventions are of a different nature than what they stand for. Therefore, formulas, geometrical figures, theories do nothing by themselves. Their usefulness arises from the fact that they stand for real processes in nature, which can be successfully expressed with it. However, the inventions are not as free as those of a script, e.g. for «Schrödinger's Cat» or Harry Potter, but must be compatible with the phenomena. Thus, empirical-logical proof has priority in principle [9, 10].

Mathematics occupies a special position: If it allows indispensable prognoses, it must be applied in the sense of Hippocrates. But one must be clear that the causal justification of its usefulness is missing. This was Einstein's central objection to Bohr's claim that the quantum theories were complete. Einstein described the formulas of the quantum theories as indispensable, which would also have to find their way into a «complete» version [9]. However, according to Einstein, this was just as missing as the «complete» version of the mathematically also irreplaceable general theory of relativity.

The priority of the connectivity to the phenomena is also valid for the use of philosophical and other tools. The Extended View uses e.g. approaches of Constructive

Realism. According to this, actors construct reality by simplifying energetic processes, which they can distinguish in the external world with or without sensory organs, as objects and their effects as «real» [17]. A hypothetical realistic approach is also used, from which also Darwin and Einstein started. But not taken into account is the radical determinism, which Einstein probably maintained as a professed follower of the religious view of Baruch Spinoza until his death.

*Comprehensive Simplicity — Discrimination*

In the Extended View, the action guide of Comprehensive Simplicity applies. Everything that can be observed or thought separately must be able to be formulated distinctively. If a concept is missing for this purpose, it must be postulated and characterized in such a way that its usefulness becomes verifiable, e.g. by empirical testing. Therefore, it was necessary to make the relation between the physical energetic effectiveness and e.g. the simultaneously given direction communicable. For this purpose, a term in addition to «energy<sup>o</sup>» was necessary. The term «Discrimination<sup>o</sup>» was chosen. Energy<sup>o</sup> makes understandable why a bird can fly, a fish can swim, one can heat with coal etc. Objects are thus «energetic», thus have an «energetical ability». «Discrimination» was chosen — deviating from the pejorative aspect associated with it in everyday life — because the decisive thing for its effects is to be able to make differences and to deal with them. The discrimination ability therefore enables an object to observe, to be able to evaluate the observed in a weighting way, to be able to assign and change information, to organize, but also to be able to determine the intensity and orientation of energetic effects. The sum of energy and discrimination ability thus corresponds to the Aristotelian concept of «Dynamis<sup>o</sup> (lat. Potentia)».

Then the relationship between the two had to be revealed: They are understood as two «Janus-faced» aspects of one and the same enablement. One can compare them with a coin on the hand: Then one sees either the top or the bottom. But always the currently not observed side is also part of the reality. Then it was necessary to make empirically verifiable statements from it, which must be attributed to the discrimination (or the discrimination ability) and whose usefulness can be empirically refuted or confirmed. Since the energy can be limited, not increased and not decreased, but modified, this must also be valid for the discrimination ability. Therefore, sufficiently available discrimination capacity is a prerequisite for the successful organization of cells (etc.) when an additional need for adaptation arises. This can be tested experimentally, e.g., in an experimentum crucis. Kofler et al have therefore predicted that the variations in the frequency of causes of death, which cannot be attributed to specific radiation effects but have been demonstrated in survivors of the atomic bombings of Hiroshima and Nagasaki [28], are due to competing needs for the limited available discriminatory/organizational capacity. Survivors who had two or more physical damages in addition to the identical radiation

exposure were studied. They showed — as predicted — much higher mortalities e.g. of CHD than survivors without physical damage. All other predictions (increased risk for people in the growth phase, ..) were also confirmed [18]. This work was awarded by Nobel laureate Y. Tse Lee with the Th. Kuhn Hope for the Future for a Sustainable World Award. Such «causally unspecific effects could also be proven for other acute multiple stresses», e.g. during heat or cold waves, smog disasters, after earthquakes, etc. [16]. However, this approach also opens up hitherto unnoticed possibilities for health promotion and desirable influences on disease processes. Thus the prognosis could be confirmed that by hypoxic-hyperoxic conditioning not only the physical efficiency of Alzheimer patients is improved but also their memory and cognitive functions [12]. The comprehensive approach has also proven useful in the strategy development of COVID-19 and [21] future epidemics with currently unknown pathogens [22].

*Symbol Intention° and the Dynamics  
of Modification of Key Terms*

In principle, it can be assumed that modifications occur in all areas in the course of the evolutionary process, thus also in the aspects of «dynamis°». This concerns not only the use of the «energy°», but also of the «discrimination°», and this according to the kind of the individually aimed intentions. Since an outside observer basically cannot know what an actor, who is capable of evaluative weighing, is aiming at, but without specification of a goal his actions remain untraceable, it would be impossible to justify even generalizable processes. Therefore, the «symbol-intention» is assumed as an auxiliary construction. Here it is assumed that the actor aimed at what can usually be observed. This technique was also used by Darwin, well aware that the physical struggle for survival and for as many offspring as possible are not the only goals that living beings pursue. But no one denies the relevance of these goals in a general consideration of biological evolution.

For the area up to the formation of life it is sufficient to assume the initial level of the actors to discriminate, i.e. to intend to maximize their self-determined alignment possibilities. (Discrimination ability). Life presupposes additionally the organization of inanimate (ability to organize). Meaning-oriented living beings also strive for reciprocal emotional reference (ability for emotion). Modern humans orient themselves besides at final goals (criticism ability, thus the ability to deal abstractly with abstract concepts logically). Already from this it is obvious that the Extended View is not connectable to models like Panpsychism, or also Intelligent Design.

While the symbolic intention is helpful to estimate the everyday life and the conclusions of the creative use of the characteristics typical for the currently reached evolutionary level, it reaches its limits to make insightful how link-

ages of different evolutionary strands lead to innovations, as it is the case with the appearance of new basic actors.

*Evolution to novel levels (basic actors) —  
their modification on their novel levels*

Einstein's refusal to comply with Popper's demand and to replace Newton's and Maxwell's formulas as falsified by the Special Relativity Theory was helpful for further problem solving. When creating the basic grid for the representation of the process from the beginning of the universe until today, the question arose how differentiated one has to deal with the multitude of evolutionary gains. Einstein had recommended, however, for all classical questions of the mechanics, independent of the state of aggregation, of chemical structures, whether animate or inanimate, to continue to apply «Newton». This insight implicitly contains a statement about the nature of evolutionary processes: Obviously, one must distinguish the new formation of basic actors with their characteristics from the new representatives of this evolutionary level forming under modification of these characteristics. Therefore, it is enough to make the self-formation of the sequence of basic actors understandable and to limit one's interest to the modification of actors and their processes for which one wants to make operational statements. Thus, in the case of the Extended View, this traditionally concerns health and sustainability. Therefore, the field of physics could be limited to the characterization of the mechanoitons, the most basic actor, the atom, the cell, the sense-oriented multicellular organism and the person.

In the present paper, however, interest is extended to the micro-world vs. macro-world tension, but for reasons of competence only as far as the worldview and generalizable principles are concerned. The derivation of operational instructions for action remains deliberately excluded.

*Challenging physical specifications  
for the Extended View*

Challenging positions of physics incl. cosmology had to be considered already for the health- and sustainability-related Extended View. But from the effort to understand them, important insights for the Extended View could be gained.

*Where have remained only the effects of the energy?*

If one applies Einstein's formula  $E=mc^2$  to calculate the energetic potential inherent in one kilogram of any substance — e. g. water or gasoline — one arrives at gigantic values. 1 kg corresponds to 24.2 billion kWh. If you now think of your electricity bill, in which the kWh is charged with e.g. 0.40 €, you would have to pay about 9 billion € for the same power<sup>3</sup>. The energy according to  $E=mc^2$  of one kilo of diesel corresponds to the practically usable energy of about 2 billion liters of gasoline. For this, one would have to pay 4 billion € at a price per liter of 2.0 €. A comparison of nuclear energy with the energy sources normal-

<sup>3</sup> These and other examples, which in themselves concern standard knowledge of physicists, are slightly modified, taken from the book Muller R.: Jetzt — Die Physik der Zeit, Fischer Verlag, 2018 (pp. 54, 55, 59).

ly used for heating or running a motor vehicle also shows how little energy we can call on. The nuclear energy released is more than a million times greater than the chemical energy of the same atom. Newton's kinetic energy, on the other hand, is only mass times velocity. But energy cannot be gained or lost. It is permanently effective. What is this amount of energy doing all the time?

The Extended View proposes the following explanation: Quasi-ideal conditions prevail in the micro-world. The formerly limiting distance during the big bang was lost by permanent expansion. Therefore, the free spaces have grown constantly and could be used arbitrarily. Therefore, in this phase in evolutionary gain could be taken over only if it could be used in addition to those already available. Evolutionary gains do not go therefore in the micro world, at the expense of the creative possibilities of the previous state. The consensus shared by all (see later reasoning comparable to the entanglement) to arrive exactly at the same time at the not observable goal does not include the exact point in time, and therefore the needed speed but only the circumstance of the commonality of the arrival. Therefore this point of time can be postponed further in the consensus. However, since the energetic potential must be permanently fully employed, the speed cannot be slowed down. The consensus to the delayed arrival can be reached therefore only by detours. But there are no guidelines for this. This makes possible what is assumed to be the symbolic intention of the actors: The possibility for creative self-determined modification of their own movement.

The consensus about the postponement of the common arrival enables again and again new self-determined self-alignments, connected with a decrease of the energetic potential, which can be called up for the new evolutionary level. If one assumes this, then the difference e.g. between the 24.2 billion kWh and the nuclear energy is needed for the arbitrary self-alignment of the electromagnetic fields, which is inherent to the just radioactively decaying particles.

Since in the Extended View it is assumed that the energetic field or mechanoions are the evolutionary oldest actors, the energetic potential of the electromagnetic field captured by  $E=mc^2$  cannot capture the total potential that was due to the actors at the time of the Big Bang. This must have been therefore larger. But how large?

#### *Inflationary phase*

It was to be considered also that cosmologists assume an inflationary phase, in order to make the empirically proven area, in which the objects of the cosmos move, understandable. This area is about 1050 times larger than the extent achievable with the speed of light alone. This corresponds to an expansion in the extent of the diameter of the DNA on approx. 100 million light years. It is entitled to the mathematician to base his statements exclusively on mathematical principles. Therefore, from this point of view, the calculations of Starobinski, Guth and Linde (1979–1982) are conclusive and helpful for everybody. However, they point out for the one for whom

the mathematics is an auxiliary science that one cannot explain the cosmos on the one hand without inflationary speed which is necessary only an extremely short period for the expansion of the area. On the other hand, the question remains open how one can imagine that the space between the unimaginably many objects individually positioned before and after the expansion can be expanded. «Universe» is no the name of a physically existing space, at which one could start like with a pump. The universe has no «edge». We researchers simplify the dynamics of the area, whose «edge» we imagine simplistically, by connecting the positions of the outermost cosmic objects by an imaginary line and calling this line imagined by humans as «edge». So we work «as if there were an edge.»

Thus, according to the standard model of cosmology, it is about the period of time up to approx. 10–20 seconds after the beginning of the uranium. Statements about this phase are to be assigned to the hypothetical realism from philosophical view. The statement cannot be corroborated empirically in principle, because even with the biggest imaginable measuring effort all measuring instruments consist of light matter and must be worked with highly differentiated electromagnetic fields. These physical objects therefore inevitably represent a part of the environment for the objects of investigation that did not exist at the time of the Big Bang.

However, this challenge exists only as long as one assumes that the evolutionary initial objects were electromagnetic fields or quanta. The «Extended View» never assumed this. It also assumes a hypothetically realistically justified state at the beginning of our universe with the energetical field as starting entity. This can today be just as little empirically justified as it was assumed by Einstein in 1905 in Special Relativity Theory. But Einstein's deduction that the empirically given electromagnetic fields presuppose at least mathematically a pre-state is regarded as sufficient justification to postulate the energetic field as evolutionary pre-state and thus as starting point of the beginning of the universe. This eliminates the need for the «pump demon». The energetic potential, which made the inflationary space efficacy possible, is thus attributed to the initial actors.

#### *Dark Energy and Dark Matter*

Dark energy posed a challenge to the model because electromagnetic fields not only affect the dynamics of the shape of the universe, but also contribute to mass attraction, dark energy only light speed effects on the dynamics. If one assumes a single evolutionary process, this means that their appearance is to be positioned after the big bang and before or parallel to the appearance of electromagnetic fields. Then only the common consensus for the common reaching of the fictitious goal point with light velocity arises from the Comprehensive Conservation Principle.

But the real challenge to the understanding of the dynamics of the cosmological evolution consisted in the fact that Einstein assumed in the general relativity theory a

universe which comprises only about one fifth of the energetic potential which is considered as secured today, nevertheless all predictions for application-oriented applications of the ART are true. If one assumes that the development of the dark energy and the quantum objects occurred independently of each other, it becomes clear that the mass attraction is characteristic only for quantum objects.

Dark matter is therefore not a challenge for the ES because it was already taken into account by Einstein without knowledge of dark matter by considering energy on the basis of  $E=mc^2$ . However, this also means that all statements of Einstein refer to the course of the evolutionary process only from the appearance of electromagnetic fields. Of course, this is also valid for the statements of Max Planck and e.g. for the derivation of the IS-values.

The Extended View proposes the following explanation: Quasi-ideal conditions prevail in the micro-world. The formerly limiting distance was lost by permanent expansion. Therefore, the free spaces have grown constantly and could be used arbitrarily. Therefore, in this phase in evolutionary gain could be taken over only if it could be used in addition to those already available. Evolutionary gains do not go therefore in the micro world, at the expense of the creative possibilities of the previous state. The consensus shared by all (see later reasoning comparable to the entanglement) to arrive exactly at the same time at the not observable goal does not include the time, but only the circumstance of the commonality of the arrival. Therefore this point of time can be postponed further in the consensus. However, since the energetic potential must be permanently fully employed, the speed cannot be slowed down. The consensus to the delayed arrival can be reached therefore only by detours. But there are no guidelines for this. This makes possible what is assumed to be the symbolic intention of the actors: The possibility for creative self-determined modification of their own movement.

### Mechanoeitons, Schrödinger and the Nobel Prize 2022

#### Mechanoeton.

The Extended View uses a hypothetical-realistic approach for the very first phase of the beginning of the universe. Starting point is the mechanoeton. This cannot exist today in the initial form, because it must have changed with the evolutionary process. It is therefore impossible to investigate it directly empirically. Proofs can take place only indirectly. There can be a state of knowledge about it, which can be regarded as secured in the sense of Popper [24] if there are corresponding empirical proofs for a postulated prognosis like those of Schrödinger and Bell. This was assumed at the award of the Nobel Prize for Physics 2022.

As will be shown, the characteristics of mechanoeitons are suitable to deduce Schrödinger's positions on entanglement and nonlocality of quantum objects in the sense of Einstein. Now the evidence of their experimental

proof is available at the evolutionary oldest objects, which can be investigated today directly empirically. Thus, the empirical proof demanded by Einstein for a causal reasoning is available°. Therefore, the award of the Nobel Prize in Physics 2022 also seems to support the causality-oriented chain of reasoning of the Extended View. Thus the capstone of the building of the Extended View was proved.

The term «mechanoeton» was borrowed from Greek. There it expresses «observing, evaluating and realizing» as a single coinciding effectiveness. This corresponds to the performance of the dynamis of Aristotle. The efficiency of the dynamis takes in Aristotle's world model step by step from the ideal, other motivating God over quasi-ideal stars and planets to the persons over animals and plants to the inanimate objects, which have the least efficiency, but nevertheless can weigh evaluating, assign meanings, act this way, differently or not at all but endure and move themselves. Aristotle, however, does not use the dynamis to explain the stage structure of his world model as the result of a dynamic process. But this is currently required.

#### *Before and after the Big Bang*

The mechanoeton would thus not be «God» in Aristotle's world model, but a very much «restricted autonomous actor» (RAA), to which, however, all other RAAs that occurred in the evolutionary process can be traced back. His special position can be compared with «Adam and Eve»: Both can be recognized among all humans by the fact that they have no navel, but will use all human capabilities for everyday life and thereby change them. The mechanoeton is characterized by the fact that it has no feature of a preceding evolutionary process, but could use its abilities to be able to cope with its everyday life. This «everyday life» was the Big Bang. Therefore, the capabilities of the mechanoeitons have changed by their engagement in the process, which we call Big Bang, and this according to the capabilities of their «basic equipment». Changes by the everyday life are not evolutionary changes. Evolutionary changes, after all, arise from the fact that novel and additional possibilities have been acquired by using changes in the environment and experience in the use of one's own resources in a novel way and by adopting this use by others. Therefore, the starting point is always a novel and thus additional use of a possibility that already existed before. After completion of the Big Bang, no novel effectiveness is assumed for the mechanoeitons, as it would be necessary e. g. by the evolutionary step to the electromagnetic fields: For this, two actors (electric field and magnetic field) must interact permanently and in a predictable way and thereby possibilities from the previous state, which could be used arbitrarily before, are now used in a consensually coordinated way and therefore with an additional meaning.

The hypothetical characteristics of mechanoeitons below refer exclusively to «general principles» for a world-view encompassing many disciplines. Thus, it is about the

fundamental specifications, which are to be considered over all evolutionary levels up to the «Big Bang» in order to be able to make insightful what has been achieved today. Independently of this, an unknown number of further features («discipline-specific principles») is to be expected, which are significant for the respective sectoral views, because the «fundamental principles» are modified in the evolutionary process.

Their proof can be a reason to check whether they have been overlooked in the search for the basic principles. This is true, for example, for symmetry: it became necessary because it is indispensable for the initial level of the so-called Most Basic Actors (i. e. electromagnetic fields) necessary for medicine and sustainability. It can be derived from the application of boundedness and the intention to achieve ideal alignments from the «general principles»: The imaginary straight line of two symmetric synchronized oscillations of the same frequency is more exactly straight out, than a quasi-ideal straight line, which must be corrected nevertheless constantly anew, so that this becomes serpentine.

The «specific principles» are therefore specific modifications of the «general principles». Their proof is the responsibility of the respective disciplines, regardless of whether or not they see their activity as integrated into the proposed overall model. An example of a characteristic of actors in the microworld is spin.

*Hypothetically postulated initial characterization («general principles»).*

It is assumed that the effectiveness of mechanoitons («Janus-faced potentia/dynamis» with energeticity and discriminability) cannot be increased, cannot be decreased, but can be modified. The energetic potential of the mechanoiton corresponds thereby to the effectiveness of the energetic field.

Therefore, the principle of preservation is also valid for the discriminative capacity: For the bindingness of consensuses, the memory of occurred effects, the expectation of the occurrence of the possible, at best even novel.

They are not ideal not only because their potential is limited, but also because they cannot realize anything ideal, even if they strive for idealness. Considering the potentia available to them, mechanoitons are «quasi-ideal» potent. Therefore, as long as the environment does not restrict this use, quasi-ideal effectiveness and its reversibility can be expected. This is true for natural processes at the microworld level.

Each mechanoiton is unique. Each uses its possibilities self-referentially. Therefore, each, for example, strives to be the first (best, most beautiful...) to achieve its intention, however it has set or modified it. Therefore, others must be devalued, the goal upgraded («enforcement —

inhibition», Being able to «make a mountain out of a molehill» and vice versa).

However, one's own integrity is central («Do not collide»). But because of the comprehensive conservation principle, this is done with consideration of the previous experiences. They also include the dynamics of the given environment (i. e. primordially all other mechanoitons) and the expectation of their own effectiveness and the actors of the environment. This presupposes weighting evaluative weighing of the different possibilities of different kinds to be aimed at and to be avoided, before deciding to become externally effective (move, act, construct...) in this way, differently or not at all.

This means that the two aspects of effectiveness (energetic realization and weighing) take place time-delayed, although unimaginably fast one after the other. Hence the comparison with the coin on the hand, of which one can currently observe either the top or the bottom.

Since mechanoitons (and all other actors of the micro-world) are permanently quasi-ideally effective, they are self-determinedly aligned. Once they have removed the limitations imposed by the environment (spatial boundedness) by removing it, and freely choose their orientation, they use it self-referentially. Thus, good reasons are needed to overcome resistance in order for them to change a currently ongoing, targeted process and implement another. It is possible that interest in novelty helps.

As empirically proven, there can be no passive movement and therefore no natural machine models. Therefore, machine-like systems comparable to a regulated heating system in nature are excluded in this model. In principle, however, models comparable to the Merkkreis-Wirkkreis (Uexküll) are conceivable, since evaluating objects are a prerequisite for this.

*Therefore*

One (an «RAA») cannot «not communicate». One is always in mutual relation to others. (consensus orientation). This concerns not only the geometrical-spatial reference (relativity), but also the meaning reference (relationality). Therefore it makes sense to consider two locational spaces: the geometric spatial reference used in physics and the meaning space. Both have to be thought dynamically: Time can be understood for this purpose as an auxiliary quantity to the Janus-faced connection.

In physics, the space of meaning is ignored so far or put beside the quantities defined in the IS-system by the term «information», as if what is the dominating thing for the person, namely the discrimination reference, would be an epiphenomenon, comparable to the shadow, whose nature arises from the nature of the objects and the light, thus does not need its own right to exist<sup>4</sup>.

<sup>4</sup> How «the elephant can be turned into a mosquito» is proven by Einstein: «Another kind of application of the principle of relativity for the reader's amusement: Today, I am called a «German scholar» in Germany and a «Swiss Jew» in England; but if I should one day get into the position to be presented as a «bête noire» [black sheep], then, vice versa, I would be a «Swiss Jew» for the Germans and a «German scholar» for the English». But here it is not about consequences in the geometric-spatial reference, but about prejudices as a result of value patterns, i. e. about relationality. This difference must be able to be communicated (Comprehensive Simplicity).



### Schrödinger, the Nobel Prize 2022 and the Big Bang.

The sequence of the steps of the cosmological evolution could be described already in approach A. It is referred to. In approach B it is therefore only a question of the deepened derivation of their reasoning. Thereby it makes sense to relate the derivations from the hypothetical approach with the conclusions which Schrödinger implicitly addressed in his contribution from 1935 [26] and which have been empirically confirmed by the empirical studies of numerous researchers since Freedman and Clauser 1972 [11]. In this context, the University of Innsbruck was successful for decades, e.g. Prof. Zoller. With the award of the Nobel Prize to Clauser, Aspect and Zeilinger, Schrödinger's positions were generally recognized.

#### *On entanglement*

Schrödinger took the position that entanglement could be artificially achieved by simultaneously producing and the emission of photons, whose entanglement would be preserved even though they were moving in different directions. This situation was also given at the Big Bang. Therefore it is to be assumed that all initial actors of the Big Bang together with their evolutionary «descendants» are entangled at least up to the level of the photons in this respect. Schrödinger's heuristic statement is corroborated by the empirical studies, beginning with those of Clauser and Freedman [11] in sufficient extent, so that it is to be called state of the knowledge.

The same result is reached with the hypothetical-ly assumed «fundamental principles» of the «Extended View». This represents an empirical proof of this position of the hypothetical deductive approach. Since the reasoning of the phenomena is based on a general principle, it is predicted that entanglement will always occur, which involves interactions using the level of quantum objects.

With the experiments it was proved that photons are effective locally and non-locally. With it it is proved from the «Extended View» that electromagnetic fields are expression of an evolutionary advancement. With this it is also empirically justified that they should not be assumed further as initial actors of the cosmological evolutionary process.

The Extended View assumes that the gain, which is achieved by reaching a new evolutionary level, is due to the fact that consensus was reached about the exclusive use of a possibility, which was used in whatever way in the, previous state. This means that the specifications, which applied to the initial use must also apply to its special use at the evolutionary new level, in addition to the new use.

With it not only the nonlocality of the entangled photons can be made understandable, since the precursors of the electromagnetic fields are mechanoitons and with it energetic fields with their nonlocal effectiveness, but also the prediction of locality in entangled particles.

Electromagnetic fields themselves become the starting point of the modification to particle and to atom. Therefore, the entanglement of these objects would have to start from a local spatial efficacy. This prediction seems to be confirmed by the study Eckart S., D. Trabert, A. Geyer et al. [7]. Their results are interpreted in such a way that for the determination of the velocity of entanglement («a fingerprint of entanglement») of spatially separated atoms to molecules investigation methods for velocities in the femtosecond range are suitable and have also been successfully used.

Eckart et al have attempted to relate statements about natural processes in the transition region from atom to molecule to entanglement, using characteristics of electrons, among others. De Broglie has experimentally demonstrated the wave nature of mass-bearing quantum objects — like electrons. This could be compared with the now established studies interpreted as proving the energetic field nature of electromagnetic fields. Also in the case of the wave nature of mass-bearing quantum objects — as de Broglie did — a local velocity is expected [6]. This is because in the Extended View entanglement is only one way of applying the consensual principle. This is binding regardless of the velocity with which it is associated. But these questions go beyond the claim of the medical scientist to find contributions to a world view covering all disciplines and the general principles necessary for it. However, it is permitted to give thought stimuli also beyond these aspects.

These considerations of the decrease of speed with increase of the reached evolutionary level are in good agreement with key findings of physiology: Sechenov proved that the speed of the triggering of the reflex with which a frog moves its paw from an acid bath is faster, the more of the brain has been eroded. He was able to achieve the greatest slowdown in humans who attempted to indirectly prevent the reflex by asking the person whose hand was placed in the test fluid to willingly suppress the stimulus set at the same time by tickling [27].

Sechenov's investigations support considerations of the relevance of fundamental principles, appropriately adjusted, to the understanding of all evolutionary levels: «The endless variety of external manifestations of the brain's activity can ultimately be viewed as one phenomenon — that of muscle movement. Be it the child laughing at the sight of toys, or Garibaldi smiling as he is led to execution for his excessive love of his fatherland; a girl trembling at the first thought of love, or Newton uttering universal laws and writing them on paper — everywhere the ultimate manifestation is muscular movement» [27].

### On the Comprehensive Evolutionary Process

#### Defaults.

Approach A had to leave open why the Micro world evolutionary process is incompatible with the

classical understanding of evolution, which can refer to «Darwin».

#### *Micro- — Macro-World*

In the evolution of the micro-world there are only winners. All natural processes of the micro-world are reversible. This becomes understandable if one assumes that the gain aimed at with the evolutionary steps lies in the increase of freely determinable self-alignments. Since the space available for this has been extended in an immense way, only the close ranges of the electromagnetic fields have a restriction in the movement directions of the radiations. In this area the electric and magnetic fields cannot avoid other actors, because they have to prove the compliance with the consensus concerning the alignment to the final target. Basically comparable is also true for the particles and the atom. The atom represents the basic actor at the transition from the micro- to the macro-world. From the phenomena of the macro world it can be concluded, that with reaching the atom the energetic limit of the capacity available for new realizations has been reached. Available for new realizations — at least according to this model — was only the capacity which becomes free by a further restriction of the use of resources to reach the final coincidence. With the consensus about the attraction of the masses, however, the given free space was fixed and exhausted with the formation of atoms. From the point of view of the actors no restriction of the «profit» arises also from the thermodynamics growing out of it. The range of freely selectable alternatives is extended to new ones anyway.

#### *Three times Darwin*

We owe to Darwin and probably also to complex frame processes also in the Anglican church that the idea of a single evolutionary process of the emergence of inanimate forms of being has found such wide acceptance until today that the idea of a seven-day creation has been abandoned. Darwin used thereby a hypothetical realistic approach, since he started from one or more today no more observable original cell, which in unknown way from inanimate structures, which were to be led back in their turn on matter and forces. In the sense of the Extended View he assumes basic actors for the micro world, for the atom and for the animate world. He rejected concrete statements about the processes to be assumed thereby with reference to the missing data situation. He also used the principle of symbolic intention to be able to make generalizable statements for the evolutionary process, which, however, takes place exclusively on the individual level. It is essential to distinguish between the arguments Darwin made in the Origin of Species [3] and the Descent of man [5]. The Origin of Species is not about man. It should only «throw light on the origin of man and on his history» (Conclusion, Origin of Species 1859 [3]), while he emphasizes that for the biological development the Origin of Species is fully applicable to the pri-

mate Homo Sapiens [4]. The death of the individual living being is inevitable, in spite of metabolism, storage of information, emotional care etc., which are continuously developing.

On the other hand, for the understanding of man as a person, it is necessary to assume an evolutionary modification of the still valid principles of the Origin of Species, namely sympathy, which he defined detached from love. «No tribe would be able to hold together, in which murder, robbery, treason etc. would be usual... As man advances in culture and smaller tribes are united into larger communities, the simplest reflection will tell each individual that he must extend his social instincts and sympathies to all members of the same nation, even if they are personally unknown to him. Once this point is reached, there is then only an artificial limit which prevents him from extending his sympathies to all men of all nations and races... so that they would extend to all men of all races, to the weak, infirm and other useless members of society, finally even to the lower animals» [5].

Also here it is assumed that once acquired remains, but according to the new challenges e. g. of the environments and from it following living conditions or multiplication-conditioned are modified. The decisive gain concerns the ability to think logically (critical faculty) detached from emotional individual references and personal observability. It is about abstract thinking about abstract consensual conceptualities (culture, states, races...). Self-centeredness remains central, taking into account longer periods of the consequences of one's actions. Darwin does not assume selfless individuals. Nevertheless, the concrete individual decision can be diametrically opposed to the primacy of the «physical struggle for survival» and the optimization of the offspring. Which type of response is thus chosen as appropriate depends on the individual's evaluation or the biological, chemical, and physical constraints. Further, the evolutionary process is the unintended consequence of self-referral intentions.

«Darwin 1» thus determined the understanding of the evolutionary process by the biological facts. Obviously, «Darwin 2» would have liked to influence the understanding of the dynamics of the evolutionary process beyond the «struggle for the physical (and genetic) fittest to prevail over the number of offspring.» The imputed critical faculty leads him to a bio-psycho-socio-ecological worldview.

Unnoticed by Darwin himself remained the conclusions of «Darwin 3»: Since then it is general knowledge that there is the unstoppable, not predetermined but in many ways influenced and therefore influenceable evolutionary process. This means that it has to be critically judged in which way influence is taken on this process. Unfortunately, Darwin assumed that changes would lead to continuous improvement because they had to proceed that way by God's counsel.

This position seems to be widely held. The assumption that no justification is needed why something that is feasible can, should or may be done can be understood as an expression of this world view.

Is there a need for more comprehensive approaches to networked effects?

However, if one considers the measures taken by man since «Darwin», it is undisputed that fundamental progress has been made, especially in the field of natural science and medicine. One need only think of the successes of trauma surgery. But an analysis of the most urgent threats to humanity reveals that many, if not all, of the undesirable, unnoticed or unknown side effects of the measures widely regarded as desirable at the time are, or are being, exacerbated by them. The current accumulation of surprise extreme situations should also raise the question of whether currently available methods are adequate to provide timely warning of threats. How good can forecasts for the occurrence of complexly conditioned events be, as long as the statements of the affected special field only have to stand causally unconnected on risk levels next to each other?

#### **Closing the Gap by the Extended View.**

Also Darwin started with the pre-state at the reasoning of the evolutionary level of the person, thus the human being understood exclusively as a primate. Therefore, also in this respect a connectivity to the argumentation of the Extended View is given: The new must be made understandable from the possibilities of the given, i.e. of the previous state. Therefore, the possibilities and symbol intentions of the inanimate actors are assumed, by whose modifications the characteristics decisive for life could have been created.

For this purpose, a proposal was presented in the Extended View, which is based on the actually observable phenomena of chemistry on the one hand and biology on the other hand. Chemical processes are understood as a more differentiated form of processes based on atoms and thus as evolutionary differentiation of quantum processes. These were assumed to have the symbolic intention of increasing the possibilities of self-determined variety of movements. The possibility to increase the variety of self-determined movement processes can also be increased by causing others to move according to one's own ideas. Thus, if a creative attentive actor would recognize that other inanimate actors under certain environmental conditions prefer to choose this or that kind of self-determined movement orientation, he could cause this to happen when he can implement this knowledge. To do so, he must succeed in triggering and terminating the corresponding environmental situation. In practice, this is achieved by using an inorganic catalyst or an enzyme. The processes of e. g. catalysts represent only a special application of processes, which take place on atomic level between actors, which can be understood as evolutionary advancement of quantum processes according to the principles described above.

This process is thus fully covered by the modification of the general principles assumed.

There is no life process without catalysts or enzymes. For this novel use of the discrimination ability for the organization of others without their «knowledge» a further differentiation of the discrimination is necessary: The term «organization ability» was chosen for it. But there is also no life process without DNA or RNA. This allows the conclusion that with the organization of others with the help of catalysts or enzymes the capacity of discrimination is reached. Therefore an instrument is needed to store the meaning of structures. At any rate currently this succeeds with the help of DNA and RNA. These are crystals and thus actors whose external structures remain constant. They can be reproduced and can be passed on. The assignment of meaning to structure and consensus about it are standard in EV. Further explanations are not given here, because the required gap between the micro-world and the life processes and Darwin's view of evolution has been made understandable. Reference is made to the relevant literature.

#### **To capture the dynamics of complex interactions between different participants: The parable of the chess game.**

Pictorial, true-to-life parables facilitate the grasp of complex interactions. Important elements of the emergence of novel and the processes that are essential for the invention to outlive its inventors can be illustrated by the game of chess across the different levels of evolution: Two creative princes, who already as boys liked to measure their strength playfully, do not want to do without it in their old age, but without their own risk and without the need to really harm the other. They invent the game of chess: they used given materials such as wood and stones to make pieces that symbolize their court and assign them permissible movements on the symbolic battlefield. There is no logical way to deduce that the playing field is exactly 8×8 alternating white and black squares or why there are how many figures of which types. However, it is important to be able to visually distinguish between the different types of pieces. About this, a «subset-constitutive consensus» about the meaning of the structure has to be established for the community of chess players, who are only a subset of all players (structural consensus). Each piece is assigned — again freely invented, but by consensus — which moves one is allowed to make with them. These process consensuses are not directly visible visually. But if you observe chess games long enough and attentively enough, you can deduce the rules of the game from the processes. Thus, in addition to their original nature, e.g. to be flammable, the wooden pieces get a new kind of meaning that has nothing to do with wood. The consensuses are kept because each of the two players thereby gains a new quality of freedom for self-determined, creative movements that challenge the other player. This gain only exists because it is predictable that the rules will be fol-

lowed. This does not require any predefined laws that have to be followed. They voluntarily behave «as if» they were forced to. How is an outside observer supposed to distinguish whether this happens voluntarily by consensus or by a divine predetermined law?

But those who do not know the rules can only recognize that they are wooden figures in black and white, standing in spatial constellations. That their actual essence is determined by their meaning in a space of meaning cannot be deduced from the visual. This is even more true for the fact that the current meaning arises from the relationality that results from the current and potentially possible future position in relation to all other figures on the field. Those who know nothing of the space of meaning will try to derive everything by the dynamics of relativity, that is, the dynamics of spatial relation, to the other physically characterized objects. So the real essence of the chess game and of the individual movements is that the physical change is made in the way corresponding to the meaning to be transmitted. Schrödinger might have expressed this by saying that the entanglement and nonlocality is the real essence of the quantum processes.

If such a person, who is also interested in experiments, would come to a running chess game and would experience that one of the pieces is moved and then nothing happens for a while, he might be animated to move a piece himself. Then it can be assumed with extremely high certainty that this move would not be in accordance with the rules and therefore the game would be destroyed. This is similar to the situation with artificial entanglement to transmit encrypted messages. If one did not receive the message how the initial entanglement was done, the intervention would lead to the destruction of the quantum state and therefore of the decryption key sought.

The two chess players not only both have the gain of being able to stimulate each other to creative thought (WINWIN). One of both will also win and can enjoy so without risk the sensation of the winner (WIN).

But always having to play with the same partner with whom one has developed the game becomes boring in the long run. Therefore, both are interested in sharing the knowledge of the rules and the pieces with others. This way they gain the possibility to play with others as well. This inevitably led to the fact that this knowledge was spread and found its place in the everyday life of people who did not invent the game at all. Thus, the game of chess has outlived its two inventors to this day. One can neglect the fact that the chess pieces are made of wood and can therefore of course be burned, for example. But this can be neglected in practice just as much as the gain in accuracy when the Special Theory of Relativity is applied instead of Newton's mechanics to determine the fuel requirements of a rocket to the moon.

The parabola of the chess game also proves useful in making numerous other characteristics of evolutionary

processes easier to understand. However, since these do not provide any necessary additional information for the relationship micro-macro world, their presentation is omitted here.

## Implementation

The obtained arguments are used whether to put up for discussion the announced conclusions for reasoning of the principles used by Bohr and Einstein and on the nature of mass.

### **On the principle of indeterminacy of the individual case despite predictability of the affected total effect.**

As the chess model makes insightful, the statements about the use of the process consensus in the individual case are in principle indeterminate for the outside observer and also for the actor dependent on the last move of the co-player. What is predictable depends on the level of knowledge of the one who makes the prediction: If he knows the rules of the game, their observance is predictable. If, despite diligent observation, he has not yet grasped them, the final result remains predictable: Every game ends with the flipping of a king.

### **About the complementarity principle.**

According to Niels Bohr, the opposite of a deep truth can be another deep truth, while the opposite of a correct statement is a false statement. The chess model provides several possibilities why this postulate can be applicable: For example, predictability and non-predictability seem to be mutually exclusive, although both cases can be proved empirically. But the incompatibility exists only if one does not take into account that processes are only «as if» necessarily occurring. The duality of wave and particle seem to exclude each other. If one assumes the principle of simplification and the consequences of different positions of the observer, the incompatibility dissolves.

### **To the principle of coherence.**

According to this principle, if possible, the results of quantum processes must be communicated with the terminology of macrophysics. This seems to be appropriate because the measurements can be made only with devices, which allow to grasp the processes on their own level. The measuring devices are part of the macro world.

### **The equivalence principle.**

Accordingly, it must be assumed that there must be a commonality «behind» the processes recorded so far, if two different quantities — in the concrete case the inertial and resting mass — always show the same result. Then there must be a theory, which proves them to be identical in essence [30]. The reason for the postulation of this principle and the development of the general relativity theory was Einstein's «happiest thought». «If a person is in free fall, he will not feel his own weight». However, if the free fall, were affected by an opposing force, the person would feel the pressure on the soles

and observe that the object, which was previously also in free fall without the opposing force, would move upward when affected by the opposing force. The equivalence thus refers to the correspondence of the effect on the affected observer observing himself and the effect of another object determined by this observer as an external observer. Again the chess model helps: The chess player will move the same piece identically as the uninvolved observer sees that the piece is moved. And this remains identical in whatever phase of the chess game the same piece is moved.

#### To the derivation of the essence of the mass.

For the wall-seeing researcher the measurement of the resting mass allows a statement about the energetic potential of a (quantum) object independently of it in which also changing process it is involved (principle of conservation). From the internal view of the (quantum) object with this mass it needs a sufficient reason to change the current activity. It is assumed in the Extended View that the current quantum activity corresponds «quasi-ideally» to the use of the symbol intention, which is not accessible to the external observer, and that the objects are granted freedom of choice. The sufficient reason to choose the alternative must therefore at least lie in an expected «quasi-ideal» effectiveness. This is to be assumed per se in the micro world. The reason for the change is therefore seen in the novelty value of the offer, which could lie in the arbitrary usability for creative self-direction. This also corresponds to the chess model: The move of a piece of the partner represents a change in the relativity of this piece to the other pieces to the outside observer. The response to it should at least not worsen one's own position. However, this is not accessible to the wall-viewing observer.

### Summary

The combination of the additional statements about the connection between micro- and macroworld presented in Approach A with the possibilities of the Extended View allow a proposal, according to which the

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open questions about the unification of physical theories can be answered in accordance with the connection to the integration of physical processes into biological and psycho-socio-cultural processes, which was sought by Einstein and Schrödinger.

It is assumed that there are no hidden variables to be considered. Therefore, all empirically validated statements may be viewed from an expanded worldview without the need for additional empirical studies.

Schrödinger's position, according to which entanglement and nonlocality determine the essence of quantum processes and local effects are consequently prerequisites for them, was supported by the proofs honored with the Nobel Prize. They substantiate the hypothetically realistically assumed deduction of the Extended View that the energetic field is an expression of the physical potential of the initial actors of the evolutionary process.

By awarding the Nobel Prize for Physics 2022 to Clauser, Aspect and Zeilinger, Schrödinger's position is considered as a secured state of knowledge. This supports the general principles of the Extended View model. This can be understood as the capstone of the complex edifice of the Extended View.

Since there is now a proposal how the postulated principles of Bohr and Einstein can be understood as a consequence of the principles derived from a comprehensive view of the world, which also makes the resting and inertial mass insightful, the hope seems to be given that the General Theory of Relativity could turn out to be the «mother of all theories» after all.

#### Acknowledgments.

I received important professional input in the peer review process, for which I express my sincere gratitude. I would like to thank Bartenbach Christian, Cornelissen-Halberg Germaine, Glazachev Oleg, Kofler Heinz, Medeiros Ephraim and Zoller Peter for some important partly controversial positions.

Irreplaceable help in the effort to be comprehensible across disciplines I received from Biedermann Ursula, Erhart Christa, Killinger Roland, Kofler Heidrun, Lippe Irmgard and Vogl Wolfgang.

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