
CONSCIENTIOUSLY LOOKING FOR CONSCIENCE

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Abstract

Conscience simulation demands to transcend from computability to simulability. Therefore, an intensive effort on extensive research to integrate essential mathematical and physical knowledge guided by philosophical goals is necessary. A way to begin is hierarchical simulation. Coexistent interdependent hierarchies structure the universe of models for complex systems, e.g., hardware-software ones. They belong to different hierarchy types, defined by simulation abstraction levels, autonomous modules, classes, symbols, and knowledge abstractions. Applying *Divide et Impera et Intellige* to hierarchy types reveals their importance for intelligent simulation. The power of abstraction is the real measure for the human mind. Turning the abstraction into comprehensive construction could be the aim of humanity, the unique God for different cultures of free humans. The way to freedom is by understanding necessity. We have to recall our conscience, to reintegrate our mind, and to remember that society has to assist humans to live among humans, not to consider that they only have to work for it. An operating system serves the autonomous programs, both for the function of the hard and for development of the soft. The society has to assure health and education for every human, and encourage search and research for any conscientious human.

Keywords: intelligence, faith, conscience, simulation, hierarchy

1. Function, structure, simulation

At the beginning was the word. Words enable us to express ourselves, to be humans among humans. The expression is complex, so it has to be hierarchical in order to be comprehensible. Words are sequences of letters, sentences are sequences of words, and texts are sequences of sentences. Phrases, paragraphs, subchapters, chapters, volumes, etc can enrich the levels of the textual hierarchy. The hierarchy is not necessary linear. The basic hierarchical type is tree-like, to optimally represent the generic strategy of *Divide et Impera et Intellige*, or even graph-like, in order not to constrain the links between levels. The sequence is an ordered set, i.e., a function that applies the first n natural numbers on the set M : $\text{sequence} \in \text{IN}_n \rightarrow M$. If n is finite, it is the number of sequence elements. *Structured set* = (Set, structure)

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Class, concept, term are aspects (syntax, semantics, pragmatics) of the expression. Class is a primitive notion. Set is a class that belongs to another class. The set operations are paradigmatic: serial (\cup), parallel (\times), or hierarchical (\wp - set of all parts). The possible expressions form a *language*. Syntax, semantics, and pragmatics define any language; the rules of each of the former defining components refer, respectively, to correct construction, interpretation, and application.

Syntax is determined grammatically: grammars are of different types that can build a hierarchy that corresponds to the reciprocal inclusion of the defined languages. Grammar is a language that refers to the language that grammar defines, i.e., is beyond the defined language—a metalanguage. This is another hierarchy type than modularization (of a text) or inclusion (of the languages due to the stronger rules of the defining grammar). Its definition is based upon the principle that each level is a metalevel of its inferior ones. Further, the language can be symbolic, and symbols can symbolize other symbols, what reveals another hierarchy type. We classified, we symbolized, we divided into modules, and we reflected an inferior level (language) on a higher one (grammar).

Grammar is a language, so it has a grammar, which, if isomorphic to the initial grammar or to the language itself, would mean that we obtained a reflexive language, i.e., capable to express itself. Classes, symbols, and modules permit the construction of a *system* that structurally implements a function expressed in a language, i.e., behaviour. In the same way, with classes, symbols, and modules, the behaviour of a structurally described system can be determined. Another hierarchy type orders the variety of languages that describe the function and the structure, the simulation hierarchy. It assists passing from the goal function, constrained by functional parameters, to the structural form, and the inverse transformation that determines the mathematical function or the physical behaviour of a system characterized by structural properties.

Simulation is the relationship between function and structure. Researching Intelligence by simulating it, to enable intelligent simulation, demands the study of combined essential mathematical structures (algebra, order, topology), to understand the different hierarchy/ abstraction types. As it is a hierarchic relation between static and dynamic structures, and even between structural and functional, the simulation can contribute essentially to understand the human mind. As in any dichotomy, *Intelligence* and *Faith* can converge toward integration, or can destroy one another if not associated.

1.1. Conscience is the link between faith and intelligence

- *Function* is a transformation that can be mathematically formalized, $f \in \text{Domain} \rightarrow \text{Codomain}$, or physically instantiated as temporal behaviour.
- *Structure* is a set of properties that characterize a mathematical or physical space. The properties can be constant or variable in time, reflecting static or dynamic structures.

- *Simulation* is the relation between function and structure. Structured set = (Set, structure).
- *Language/System* is a generic form of a mathematical/physical model.
- *Model* results from an inversion-able representation of the simulation object.
- *Abstraction* is a human defining capacity that enables him to think.
- *Hierarchy* is a functional/ structural concept that fulfils mathematically/ physically the concept of abstraction. Hierarchy = syntax (abstraction).

God is in us - as the Faith is part of our definition, *with us* – by the others, and *for us* – by the spiritual *evolution*, that is first conditioned, and then assisted, to be followed, by the social one. To prevent the danger of dichotomy, we concentrate in three different ways on the unique Reality (*Plato*) [1]:

1. *Art for the art* - to look for the essential Way,
2. *Science with God's fear* - to search the existential Truth, and
3. *Engineering-technology* - to understand the Being and to concentrate more on the Spirit in our Life.

2. Abstraction, hierarchy, reflexivity

The power to abstract is the crucial difference between human and any other natural being. *Divide et Impera et Intellige* applies the hierarchical expressed abstraction. The abstraction can be simplifying or reflexive. The simplifying abstraction concentrates on a superior level the information that is considered essential for the current simulation approach. Reducing the informational complexity has in view to clear the operation and to ease its formalism; it can be only quantitative, but also qualitative, i.e., it can affect the simulability of different aspects of the simulation object. The reflexive abstraction, expressed as the knowledge hierarchy type, tries to understand itself better on each superior level, by better understanding the inferior levels.

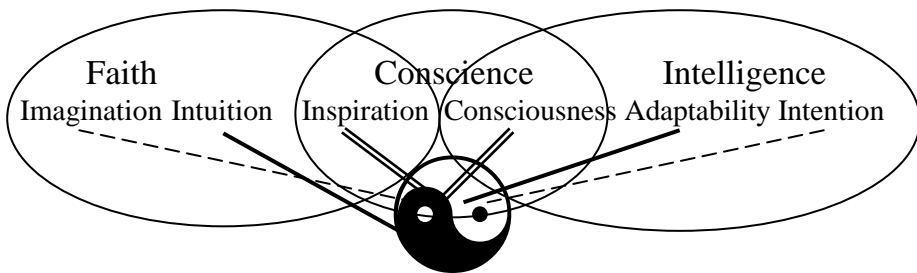


Figure 1. Human mind.

We extend the reconfigurability to the simulation itself (Figure1). First, by a self-aware simulation, we get self-control of the simulation process. Therefore, we build a knowledge hierarchy corresponding to the simulation hierarchy. Then, by expressing both simulation and knowledge hierarchies in the reference

system of the basic hierarchy types (classes, symbols, modules), we create the context for a self-organization of the simulation. The triad of the basic hierarchy types corresponds to the fundamental partition of the real life (beauty-arts, truth-science, good-engineering), that has to be continuously integrated by *philosophy* (essence, existence, being). Therefore, we try to model the Conscience for simulating the Intelligence, and then to reach for intelligent simulation.

Both intelligent simulation and the simulation of Intelligence demand transcending the present limits of computability toward simulability, by an intensive effort on extensive research to integrate essential mathematical and physical knowledge guided by philosophical goals.

Arts and Science are equally noble, even if one appears rather spiritual and the other rather material. Their alliance is vital and demonstrates the insolvability of the nowadays *Spirit-Matter dichotomy*, and of all resulted secondary dichotomies, actually functionally generated by the *Space-Time dichotomy* that is necessary to the human *evolution*. *Society* is only the memory of the past, the manager of the present problems, and the assurance for a right future. We have to live together in respect of the others on the way to understand each other, in order to evolve toward essential beings for an integrated existence.

Human among humans should reflect a strategic equilibrium, without hiding or even violating, as happens nowadays, the principle that the society has to assist the individual to educate him/her correctly, enough and unconditioned, and to help her/him by an intelligent Faith to search and research the Unknown. The Unknown can be interpreted as a *unique God* that represents the absolute freedom by understanding all the necessities, and the absolute unity by closing all the *Divide et Impera et Intellige* necessary to the Way to look for the Truth along the Life. Reason is an extension of the Nature. Nature is not an ephemeral context, but the matter we are built of in order to develop spiritually. The integration experiments for the Spirit-Matter dichotomy failed because of their extremism. The present society is extremely materialistic, and tries to destroy every trace of ideal. We have to surpass the limits imposed by the essential dichotomy by a unique Ideal, named God, that should be constructive by continuous intelligent reconfiguration. The most benign social system is not democracy, if the education for any human is not granted.

Hierarchic types are stratified structures. The levels represent different domains (abstract or concrete). Abstraction links the different autonomous levels inducing an order relation (partial—with respect to the objects, total—for the levels), what permits to consider superior and inferior levels. The hierarchic principle can be applied both to the knowledge and to the simulation, in order to maintain correctness when the complexity is rising. The decomposition of the problem on more abstraction levels helps to bind locally the complexity. The systematic design that results from the hierarchical approach assures an almost correctness by construction; the complex verification/optimization becomes less hard and more understandable.

3. Divide et Impera et Intellige: beauty, truth, good

Philosophy is not a specialty but a human right. There have to be schools to prepare the teachers of philosophy for the other humans. These schools have to develop also respect for those that look for the Way on one of the three alternative paths that correspond to the fundamental partition (arts, science, engineering).

Mathematics is one of the arts. The music [2] is at least as beautiful and expressive, but Mathematics does not demand an extraordinary talent, allows a reasonable dialog about it, and has well-defined reconfigurable limits of that it is aware. It has to be educated as soon as possible and has not to be confounded with its handcraft. The music gets more often out of its character. Anyway, the two arts evolved together: *Bach, Vivaldi, Haydn* were musically gifted mathematicians, who preferred the liberty of music to the bands of the Reason. The Reason, as initial zone, makes Mathematics more sure but less charming than the other arts that can refer directly to the Reality: music and literature. The visual arts are too dependent of the Nature because seeing is the most used sense for the human natural being. The mathematics school is continuous, whereby the literature and the music can generate sooner higher singular peaks: *Shakespeare, Beethoven*. Arts are free. But Mathematics first expressed reasonably that Reality could only be known by Reason

Physics is the Science. The other natural/social sciences are its chapters, even if they are not yet aware of it, or just try to return to their riverbed by intermediary specialties instead of integrative bridges. As any artificial system, the society is structured on natural bases, and it develops by natural laws. While the modern age, these laws were forced towards Reason, and recently they got out of control. The social laws got also unreasonable (in the bad sense). Physics is essential for the constructive reconfiguration of the Faith.

Engineering is most frequently both art and science, and is as important as arts and sciences in the fundamental partition of the Reality needed for evolution. However, it is more dangerous than its alternative approaches, of which it has to be strictly bridled. Reasons are twofold: its result, called *technology*, is defined by its complement – so it is not superior to this, and it does not impose spiritual proximity between the creator and the user – so it can be applied in a complete different scope than it was generated. However, any engineering is the homonymous complement of a special science that collaborates with Mathematics. Therefore, this problem is solved if the sciences are integrated into Physics and if Mathematics remains one of the arts.

Einstweilen bis den Bau der Welt Philosophie zusammenhält, erhält sich das Getriebe durch Hunger, Furcht und Liebe (Until the world construction on philosophy is based, it functions by hunger, fear, and love) Friedrich Schiller

4. Intelligence. Faith. Conscience

Divide et Impera et Intellige has three parts as *alle guten Dinge sind drei* of the most philosophic European people. Mathematics develops by three basic structure types, integrating them. We divide our Universe in three worlds: essence, existence, and being. We divide our existence in three interdependent components: arts, science, and engineering corresponding to our beauty-loving ideas, our truth-searching efforts, and our good-oriented constructions. The third part is presently exaggerated to exclusivity.

As the Reality contains abstract ideas, even if physics could explain everything as being discrete, the power of continuum cannot be forgotten. Consequently, the analogue engineering cannot be neglected in modelling and simulation. Physics permanently uses as dichotomy the discrete-continuous, while the engineering-technology just adapts intuitively—as any primitive life form—to the requests of a consumption-oriented society—characteristic for the primitive life. The Reason for this is that presently the engineering escaped from the control of the inspiring arts, and of the Consciousness for the science conditioning its existence.

Mathêma = science; *Fisn* = nature, universe, world, landscape; *Tekhnè* = arts;
Theos = god, *Theôria* = procession, *Theorein* = to contemplate; (Greek)
Calculus = little stone; *Ingenue* = free minded; *Ratio* = number, account. (Latin)

Mathematics is the most accessible of the arts, science of the abstract ideas, and engineering of the Beauty. It discovers and studies structure types: (algebra, topology, order) that correspond to (construction, orientation, understanding). Mathematics is an example to science and engineering of correct and complete integration. *Arts for the arts* is a self-definition, the liberty to create Beauty, by thesis-antithesis-synthesis, dialectic principle that governs the evolution by closure to the inverse.

Physics is the paradigmatic science, the art to represent the Nature—as exercise for the Reality, the engineering of the Truth. It has to integrate the fundamental forces in a theory, and all natural and social sciences as chapters, leading them to a real application of mathematics. Social sciences study a universe as complex and nondeterministic as the natural one, therefore mathematics is at least as important. Recognizing the physics as the fundamental science, mathematics could be more directly inspired by the sciences. The science raises the fear of unknown, and the research inspired by it, to zones that are more abstract. It is hierarchically defined, *with God's Fear*, looking for the Truth. The science evolution bases on qualitative leap consequent to consistent and convergent quantitative accumulation.

Engineering—art of construction, science of simulation, technology of Good should develop closer to Mathematics—approach, integration of parts, not only applying techniques, and to science—courage, multiple perspectives, not only regarding the results. Concentrating exclusively to the Good in the life is

very dangerous, as the third part of Reality, also called *mental world*, is defined by its complement, and therefore is not superior to it if not closely constrained by Arts and Science. Denying the negation is not a context-free game.

4.1. Faith and intelligence are ☯ in our life. (way, truth, life)

For physical or philosophical orientation, we need *cardinal points*. To inspire ourselves of the most pure of the arts, we learn about *cardinal numbers* - although, being sincere, mathematics leads the way to show that nothing is pure.

So without leaving anything behind, the Way has to be followed further. Cardinal numbers are numbers of elements in a set; sets can be infinite. The Nature demands the least infinity and is defined by (0, successor, induction): $\text{card}(\text{IN}) = \aleph_0$. Adding is in Nature's definition. However, the inverse operation, subtraction, needs negative numbers. We close mathematically the Nature to an *integer* that opens the physics for recognizing the limits of the Reason (electrons), in the meanwhile, attracting marvellous engineering solutions for different technologies. Electronics is among the most advanced engineering sciences; therefore, it has to be practiced by the most conscientious human beings. Recurrent addition is multiplication, a most important parameter for the Nature. Mathematics closes the integers to the multiplication inverse, defining the rational numbers. These are not more than the naturals, but we can do many useful things with the Reason, from strategy to computer.

So *what else do we need?* say too many, forgetting that the limits of the, so-called, *pure Reason* are caused by the fact that it bounds itself to close the Adaptability to discrete/ sequential operations. Thanks God, neither mathematicians, nor physicists accept all-happiness. They discover in three ways (order, algebra, analysis), which assisted all of them to think together, the power of continuum and that of the patience. In this context, *mathematicians and physicists* means the theorem, natural laws, or even new approach discoverers, and more, the engineers that understand the essential of mathematics and of physics. We should not forget the third meaning of *cardinal*. It points to an unwise use of *Divide et Impera et Intellige* as a strategy called *when two fight, the third wins*. This means to intervene only when the fighting forces begin to get unbalanced, in favour of the less strong, to conquer all fighters. If the victory must be completed, both the pseudo-ally and the pseudo-enemy are firmly assisted, discretely or continuously, to loose control, because of all-(un)happiness. The 20th century is a too convincing example.

5. Evolution by closure to the inverse

The *Ackermann-Peter* function - anticipated by the recursive functions hierarchy of *Sudan* - shows an intuitive model for discrete computability and the limits of discrete/sequential computation. The primitive-recursive functions are obtained of some elementary operations of the set of natural functions with more

natural variables by closure to composition and recurrence.

The resulted model is not complete without a nonintuitive extension to denumerable-recursive functions (the link between function and equation is pure mathematical), as the APS function rises quicker than any primitive-recursive function. The recursive operation construction is very inspired, showing that the recurrent power rising is too complex.

```
unsigned aps (unsigned n, unsigned x) {
    return !n ? x+1 : !x ? aps(n-1,1) : aps(n-1,aps(n, x-1));}
// aps rises with x (for n = 1, 2, 3) +-like, *-like, exponentially (1)
```

The inspiring example suggests the existence of an implicit link between the limits of the sequential/discrete calculus: complexity and computability. Presently, we talk about electronic computers, but the nowadays trend is to copy from the living nature, i.e., the emulation of the advantages the living beings show to achieve unconsciously complex duties. The vanguard domains are biotechnology and computational intelligence. We understand well neither Life nor Intelligence, so it looks like *Der Zauberlehrling*. More important is that emulation is less human than simulation, so they should always develop in parallel, permanently exchanging experience. Reality does not reduce to Nature, as cardinal (\mathbb{N}) is strictly inferior to cardinal (\mathbb{R}). Reason is the closure of the Nature relative to the primary operations, as \mathbb{Q} is the closure of \mathbb{N} to the inverse operations of addition and multiplication. However, the Reason is dense in Reality, as the real numbers are the analytical closure of the rational numbers i.e., $\mathbb{R} = \{\lim_{n \rightarrow \infty} (q_n) | (q_n) \in \mathbb{N} \rightarrow \mathbb{Q}\}$. Reality extends beyond Nature and Reason, not just for the quality of the quantity, but also regarding the power of transforming operations. \mathbb{R} is the closure of \mathbb{Q} to the inverse of power rising—the last arithmetic operation resulted by recurrence of the prior one, which can be pursued by Reason. Further, the closure regarding the inclusion order – the set of all subsets of \mathbb{N} , \mathbb{Z} , or \mathbb{Q} in general, of countable sets, is the uncountable set of real numbers. \mathbb{R} represents the power of continuum. To get from real to complex numbers is just a matter of Imagination. Reason closes the Nature to the inverse of natural operations. Reality is the closure of the Reason to the inverse of artificial operations, or to the reasonably deducted infinite, or to an order over the Being itself. We know that if there were no cardinal number between the natural/integer/rational discrete and that of the real continuum, then the logic would include the principle of the excluded tierce. This hurts the Human, who is thirsty of nuances. Therefore, we can prove that there is an intermediary level between Reason and Reality – *nonconstructive*.

There are angels between Human and God said the wise [3]. The density of Reason into Reality means that every real is the limit of a sequence of rationales. Therefore, we hear nowadays that if we master the Reason, Reality becomes a complexity problem, i.e., speed of convergence. We dare use mathematics as metaphor for the relation between Nature and Reality, but it is only a correct inspiring analogy. \mathbb{R} is an initial step in Mathematics for Algebra, Topology, order, or their collaboration. Mathematics is for Reality just one of the favourite ways to get the Human closer to it [4]. There were times of the

Reason when Mathematics was free, creating itself the necessities, and even if Physics had sometimes to make the needs aware to Mathematics, they both always followed the way to Reality. Nowadays, there is no *Nobel Prize* for Mathematics but only for its economical applications. Nowadays, there exists no liberty by understood necessity, only by satisfied economical needs. Nowadays, the Reason cannot reflect the Reality. The density of \mathbf{Q} in \mathbf{IR} shows that between any two real numbers there is a rational one. Therefore, Reality is much more than Reason can even imagine, but something reasonable exists between any two real objects—*nonintuitive*.

Neither Intuition nor Reason arrives to something that mathematics proves elementary. As any true art or beautiful Science of the ideas or the phenomena, Mathematics does not limit itself to either Intuition or Reason, allowing them to collaborate by Conscience. We touched the *Mathematics-Physics* that the modern School considered alternative to Human. However, every human has to be hallowed with the unique strategy for consistent education that the receptivity and imagination for any human work. The recent School replaces the alliance Beauty-Truth, in the most pure form, with an advertising name *Mathematics-Informatics*, considering itself a part of the consumption society—the most efficient distracter of Spirit and of Human ever. Informatics is a first result of the collaboration Arts-Science-Engineering. It is very inspiring de jure, but very exploited de facto, for the grotesque materialistic exaggeration that all we need is good, and that engineering is the only creative activity. Hence, engineering deserves development in any direction, from spiritual toys for all ages to technological drugs, arms of any calibre included.

6. The pure reason experiment (spiritual, social, technological)

The Faith experiment, based on concentration, search, and construction, took place in the Middle Age by spiritual and chivalrous search, mediated by Masonic buildings. The Cathedrals were the symbol of the coming *revolutions* that intended to institute the constructive Faith as basis of the human society. *Napoleon's Code* witness that the prepared superior level of the human-social evolution was not any sort of capitalism. *USA Constitution* contains the common measure called money, endeavouring the grotesque relation between human and society. The society is conservative – it tries to last forever at any evolution level, using a common measure. Everything can be evaluated, although most of the essential things on that our existence bases its being are not measurable. The so-called pure Reason, i.e., the context-free Reason – most adaptable, conscious only for having, intended by the tactics of the consumption society, and totally unfaithful, gives the necessary force to stagnation or even to choosing a wrong way. Unfaithful means here that the components of the Faith (Inspiration, Intuition, Imagination) are used separately to serve the competition for the Good that makes present Life credible. However, the society is less than reasonable, whereby, the irrational of arts, particularly in Mathematics, is more than reasonable, opening the way to Reality by closure to an essential and radical

operation. To master the *New Power* of the continuum is beyond Intuition and Reason, if they do not integrate by Conscience and do not collaborate by Imagination and Intention.

The historical experiment of the pure Reason was the necessary intellectual condition of the first – and by now – the last, social revolution. The initial goal of this event was a reintegration of the ways to search for the Spirit from the Matter–knights, and for the Matter from the Spirit–monks. It failed because it kept the arms, the wars, and the social classes, against it initially had risen.

More important, the experiment continued beyond its historical limits, what created the context to renounce to human dignity in order to reduce the human mind to adaptability and to throw Conscience and Faith into facultative. The reduction of the constructive thinking to pure Reason weakened the human mind and made possible to restrict the point of views to the most dangerous of them. The number of alternative paths, totally different but convergent to Reality, must be 3 – the last prime number successor of another prime. The concentration of the mind on the reasonable control of the Adaptability followed the spiritual revolution, which tried to bring into individual and social conscience that the human has chosen the evolution without disregarding the Eternity or knowing the Way. The spiritual revolution selected a primitive form of *Divide et Impera et Intellige*, to begin researching what is partially known, leaving the unknown to be approached when the first step is finished. If this intention is not forgotten, the *Intellige* is contained in the *Impera* of the unknown that has to begin after the *Impera* of the partial known, with the completed knowledge that results. This first step was done simultaneously by the institution that pretends to serve God - (*Luther*, the knight Popes), and by the most human Reality approach – the Arts (*Rinascimento*, *Descartes*). Their strategy was human-oriented.

The contradictory sentence ‘to serve God’ had sense as long as the Church tried to simulate the human conscience. Perhaps was its partition thought as *Divide et Impera et Intellige* for the Way–Catholic, the Truth–Orthodox, and the Life–Evangelic, but there came no *Intellige*, and all of the alternatives fell into the exaggerating ‘-ism’. Perhaps this is analogous for Christians searching a beautiful Way, Jews researching a true Truth, and Buddhists engineering a good Life. But many of us, of any religion, and respecting the traditions, are conscious of the Way to follow, do not expect anything from a metareal God – sounds like material, and are free to laugh even of their deepest Faith. Moreover, they are able to have a good Life, just enough to concentrate on the Truth and to follow a beautiful Way. The concentration of the society on the material component of the human existence was necessary to liberate them of inhuman problems, not to attract the humans on a secondary path. Antique Greece is an inspiring model – if substituting slaves with intelligent systems. The Reason experiment had to finish 2 centuries ago:

- The pure Reason experiment climaxed by an unprecedented number of contemporary geniuses. This proved that people has to select wisely and to construct in good understanding and courageously a society that encourages/ assists them to evolve beyond the attained peaks: *Beethoven, Mozart, Gauß, Cauchy, Fourier, Laplace, Goethe, Schiller, Franklin, Kant or Hegel*;
- The cathedral builders tried to extend their work at a continental scale, neglecting the people on the building area, whose culture did not concentrate on *to have* but godly simple on *to be*;

We note that a century after Napoleon Bonaparte, a German genius of strategy, Otto von Bismarck, learning from his predecessor's experience, was even more successful in unifying Europe. However, this time the materialistic forces were already masters of exploiting the instabilities, and hurried up to transform Europe in a laboratory to compromise any idealistic movement. They helped the generation of these movements and directed them to terrorism. As we said, the pure Reason experiment was of the form: complete the better-known part – Bonaparte to its limits–Bismarck, to have more chances beyond the limits.

The falling and remaining in materialism hurt a lot both Nature and Human. The importance of the experiment was significant, but its continuation, which could be interpreted according to the results, has killed countless people and even cultures. Nowadays the materialism torments increasingly, threatening the future. The adaptability-based Reason cannot explain or control thoughts, even if sequential is extended to unlimited parallel/nondeterministic (equivalent). Anyway, these desired operational properties could be found mainly in the right Faith-oriented side of the mind. Further, the difference between continuous and nondeterministic sequential/unlimited parallelism is positive.

Therefore, the Reason has to be Faith-dependent completed to Intelligence. A being needs more than Intuition and Adaptability to surpass the Matter by Spirit; only the integration of Intuition and Adaptability by Conscience can explain the Human being. The prior considerations inspire to propose the thesis:

Conscience is the closure to (knowledge o simulation)⁻¹ of Conscience (2)

Note: initially Conscience = Consciousness //o combines 2 functions

The idea can be formally sustained in the theory of categories. Informal arguments follow. The essential limit of discrete [5] ability, inherited by the computational intelligence, is generated by the necessity for self-reference to integrate the level knowledge with metalevel knowledge in Conscience modelling. A hierarchical type expressing reflexive abstraction can represent the conscientious knowledge. The aspects of the Reality, and of the human mind reflecting it, have not to be neglected, although they are neither constructive nor intuitive [6]. A way from Reason to Intelligence is to integrate Consciousness and Intention, then further to integrate Intelligence and Faith to become *Reality-aware*. Transforming the abstraction into comprehensive construction can be the *Goal* of the Human among Humans, the *unique God* for different cultures of free humans. *Freedom is understood necessity – Hegel*. We have to remind our

conscience to integrate our mind. We have to remind ourselves that society has to assist humans to live among humans [7].

7. Human. Cultured human. Human among humans

We have to stop society to be more important than Human. This is nowadays the case, and we are on the way to live in an ant hill/a swarm/a herd/a flock/a stud, or even a pack/a horde/a crowd/a mob.

An operating system serves to the autonomous programs both as link to the hard as for development of the soft. Analogous, the minimal unconditioned tasks of the society are health and education for everyone, encouragement for culture and researching for any Human (= human with conscience). The history of the common measure is:

$$\begin{aligned} \dots &\leftarrow \textit{Philosophy} \leftarrow \textit{human Culture} \leftarrow \textit{special Knowledge} \\ &\leftarrow \textit{economic Force} \leftarrow \textit{physical Force} \end{aligned} \quad (3)$$

We could consider just the simplifying types of hierarchy (classes, symbols, modules) and then express the construction, hoping to aim the absolute liberty, if we considered God as the simplest, totally unconstrained, essence of the Reality. However, we can simulate/construct/work/live, associating knowledge hierarchies to all our activities, aiming to constructive understanding of the most complex absolute necessity, by this defining God. Abstraction is the human gift for going beyond natural limits, meanwhile extending pure reason to real intelligence. Metaphor is a popular instance detailing the thesis:

$$\textit{God is the absolute abstraction} \rightarrow \textit{the evolution goal for faith-assisted intelligence} \quad (4)$$

The Conscience is individual (link faith-intelligence), social (local-contextual relations) and universal (sense for Reality). It appeared by *Divide et Impera et Intellige* of the community conscience, proper to the eternity-oriented human structure. E.g., *in the past*: herders, farmers, sailors, Asians, Africans, Amerindians, ... Each one recognized him/herself in the cohabitants, being also adaptable and intuitive. The common measure evolution implies construction of intelligent agents to master the inferior levels and to concentrate on the higher ones. For example, industry enabled to mechanize agriculture preparing the concentration on the economy. However, the price was too big: Spirit and Nature were badly hurt, but less than their collaboration. Industry and army understand very well each other, instantiating the same principle of depersonalization of the human for a materialistic aim. A model template defines the model universe as a mathematical theory or as a simulation paradigm. Every entity has behaviour (external relations) and structure (internal relations). Behaviour can be functional (context-free) or procedural (context-dependent). An obligatory rule while we evolve towards *God-like Humans* is:

Das schöne wahre Gute (The beautiful true good) Johann Wolfgang von Goethe.

An algorithm is an entity that can be computer simulated. Therefore, it represents computability, behaviour-oriented (understanding, verification, learning) or structure-oriented (construction, design, plan). Evolution is a

multiple *Divide et Impera et Intellige* for Conscience, associated to generation of the lacking *mind components*, then assisted by these:

- Conscience: individual-social-universal (subjective-contextual-objective) → *inspiration* ↓
- Space-Time (structure-function/behaviour) → *imagination* ↓
- Discrete-continuum (natural-real) → *intention* ↓
- Beauty-Truth-Good (arts-science-engineering).

8. Eternity. Evolution. Intelligent evolution

Eternity means abstraction of time, from the point of view of human evolution. However, the humans that lived in eternity had not performed the space-temporal partition of the Reality. The knights searched for the Graal, the monks for supreme Spirit, and the shepherds the lost sheep. The knights counted their victories, the monks their rosaries, the shepherds their sheep, without considering this natural operation as essentially human. The algorithmic approach is equivalent to the formal one. If an expression is consistent to a formal system, then there is an algorithm that can confirm it. Reciprocally, for a verification algorithm of the mathematical sentences, a formal system can be defined, that considers true just those expressions in the closure of the algorithm results set, to the considered logic operations [8].

Evolution depends on the initial design of the mental faculties for surviving of the whole system, however also on the space-time context of communication among intelligent agents. The alternative ways to extend the computability [9] concept are suggested in works of the philosophical German literature. The essential ideas point the unconscious part of the mind, concentrating on: the mental world of the Good—managed technologically, the physical world of the Truth – researched scientifically, and the ideal world of the Beauty – discovered by arts.

1. Faust (*Goethe*): heuristics—risk competence for performance/imagination
2. Das Glasperlenspiel (*Hesse*): natural unlimited parallel—intuitive.
3. Der Zauberberg (*Thomas Mann*): self-referential knowledge—needs hierarchical reconciliation of discrete structure with continuous reaction, hoping to inspire the Way to Reality.

The best known equivalent formalisms for sequential computability based on pure reason are: formal axiomatic systems (*David Hilbert*), construction algorithms (*Kurt Gödel*), λ -calculus (*Alonzo Church*), recursive functions (*Stephen Cole Kleene*), *Emil Post* combinatorics, *Alan Turing* machines, formal languages (*Noam Chomsky*—grammars), normal algorithms (*Andrej A. Markov*). These wonderful men initiated a revival of the pure Reason experiment, aware of its scope. This was possible because the arts – especially Mathematics, the Physics-based sciences, as the Mathematics-inspired and Physics-assisted engineering-activities evolved independently of the social order. This was due to the intelligent faith of their masters and of the free humans that developed and understood them.

9. Conclusions

Nichts ist mir wichtiger auf dieser Welt als mehr von Gottes Gedanken zu wissen
(Nothing is more important in this world than to find the path to God's thoughts)

Albert Einstein

Philosophy is not a specialty but a human right. Our conscience is our representation of the essence of our existence as being, i.e., God is in us, for ourselves, and among ourselves. We have to be to search our essence researching our existence. *Divide et Impera et Intellige* has three parts as *alle guten Dinge sind drei* of the most philosophic European people. Mathematics develops by three basic structure types, integrating them. We divide our Universe in three worlds: essence, existence, and being. We divide our existence in three interdependent components: arts, science, and engineering-technologies, corresponding to our beauty-loving ideas, our truth-searching efforts, and our good-oriented constructions - presently exaggerated to exclusivity. As the Reality contains abstract ideas, even if Physics could explain everything as being discrete, the power of continuum cannot be forgotten. Consequently, the analog engineering has not to be neglected in modelling and simulation. Physics permanently uses as dichotomy the discrete-continuous, while the engineering just adapts intuitively (as a primitive life form) to the requests of a consumption-oriented society. The reason is that presently the engineering escaped of the control of the inspiring arts, and of the consciousness for the science that conditions its existence. Thanks God, neither the mathematicians, nor the physicists accept the all-happiness. Together with the engineers they discover in three ways (order, algebra, analysis), which assisted them to think, the power of continuum and that of the patience.

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