Toward a Unified Knowledge-based Society for Sustainability—Developing a Synthesis on the Methodological Level

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Abstract—The debates on development manifest an increasing concern for sustainability, but as yet little awareness of the hierarchy in the ideas through which humans contribute to the problem. This gap is widened by a widespread but nevertheless unnecessary acceptance of unreasonable elements such as paradoxes, or the general fragmentation in knowledge, or allegedly general limits to it. First the character of such impediments is assessed, partly in theoretical considerations and partly through examples. This analysis reveals the root of a widespread self-limitation in thinking. Understanding its structure allows to synthesize an approach in which the problems do on principle not arise. It is conceptually precise but nevertheless universally applicable within the chosen query perspective, and hence useful for unifying knowledge toward a general sustainability of development.

Outlining the Problem

The contemporanean social sciences describe an astonishing feature: in the known period of history, there has never been as much activity in international relations as now; and yet since a few decades the common of mortals feels increasingly insecure (see for example Beck [1992], [1999], Frank [2002], Landes [1999], Monbiot [2000], Stiglitz [2002]). A new uncertainty on the global level produced fear and mistrust, making arise two calls: one for more rules, laws, prescriptions, and power, as well as one for indicator systems and methods for measuring the sustainability of the development. But can they dissolve the core of anxiety, fear and distrust? Upon approaching a tunnel, one would understandably like to know more about it. Wanting to know the conditions and obstacles on the path, and making sure one can defend oneself, can be useful ingredients, but do not include the clarification of one's own perspective to the point of excluding securely one's own stance and contribution to the problems. After all, the latter are mainly man-made. The crux seems to be in the pursued objectives, whose legitimacy seems to have no better foundation than interests and values. But approaching them on this basis must remain vague, since—as Max Weber famously has argued—even the validity of values cannot be ascertained scientifically. Nevertheless, for a sustainable solution it is necessary to develop a securely complete view, including all of the viewer, his ideas, and ways of thinking. Here we encounter an obstacle that looks formidable at first glance: contemporanean philosophy and science declare in unison that certainty and completeness of view are unattainable ideals. Are we thus left only with the 'choice' of more measurements and more rules? Since these always stem from mere perspectives and can never cover all cases, they can never warrant ultimate objectivity. Somebody will always attack them, feeling sufficiently justified by being limited. Is strife and conflict therefore inescapably our lot? Acting out this belief produces more fear and distrust, more armor and bristles, more conflict ... a vicious circle (which is, as mentioned, precisely what can be observed empirically already now). Hence the question is when does one start to think about the origin of the vicious circle? The uncertainty and incompleteness of contemporanean philosophy and science make also the assessment unreliable whereby there is no other path than theirs. For thinking beyond this 'mental sound barrier', must one be coerced by pain and sufferings, or is there some prospect of success for starting to think before?

As is being emphasized in cultural anthropology, a culture survives through producing and offering encouragements for thinking before hardship arises, for being able to avoid pointless suffering. Such encouragements can only be effective when they address the understanding of problems at stake and hence the conceptual level of the public debate, even if the means for conveying a message must of course be material (the carrier of meaning should not be confused with the meaning itself, e.g., a messenger with his message).

One of the endeavors in this direction was the symposium "Toward a Unified Knowledge-based Society for Sustainability." The emphasis on unifying knowledge

is a wise choice, given the fact that only a securely complete perspective can warrant any real sustainability. Yet this emphasis proved to be a daunting task for the vast majority of the symposium participants, even though many manifested a sincere desire to move in this direction. The problem seems to be in not knowing how to unify knowledge. One layer more deeply, the crux of this 'how' is rooted in the difficulty of realizing that bridges towards more unified views can only be built by means of conceptual work, which can itself only be discussed in concepts, which then may sound very far away from anything 'real' or even 'normal' according to the practician. He or she is not trained to operate in conceptual considerations per se. Yet this level of intelligibility as such is and remains the decisive locus. Everything else revolves around it, in a preparing sense or in the sense of consequences. For secure sustainability, science itself must become fully sustainable. In this light the unifying potential e.g., of physics is insufficient, as it approaches reality in terms of 'things' without addressing fundamentally the conceptual instrumentation for grasping them in a strictly complete and secure way. This systematic incompleteness is not debated sufficiently. What may look at first like a sustainable path in one perspective can look very limited in a more encompassing view. An example: medieval Europe wanted to sustain its expansion, as colonialism was under way, so it cut down forests wildly for construction work, especially in the Mediterranean area—producing problems of erosion and draught for our era. Yet at that time all experts agreed that trees grow anyway and that therefore the chosen path was reasonable. Today many will laugh at such a crass example. But the type of problem still remains: believing to know about totality is not the same as securely knowing about totality.

In such situations, the crucial question is what kind of path one wants to pursue. Under the impression that one has to decide and act under the presently given conditions (uncertainty of knowledge), there is no other choice but to proceed pragmatically, adopting the state of the art and hoping for the best—even though this may not be the optimal solution, or may even lead ever deeper into problems. The vast majority of the currently debated theoretical streams has nothing better to suggest. Nevertheless, this path is not totally satisfying—which is not very astonishing since it has its roots in mere beliefs. While some practical decisions may have be taken pragmatically, it is thus very reasonable to limit these to the strict minimum, pursuing simultaneously also all investigations for reassessing uncompromisingly the very foundation of methodology towards the prerequisite of real sustainability: a real unification of knowledge.

From a thoroughly encompassing point of view it makes thus sense to address especially the fundamental interconnections in a new way; that is the purpose of this essay. First I will outline a problem that has escaped broad attention: the character of the limits to knowledge that are inherent in today's mainstream methods, whose root is in the habit of setting out from basic assertions (axiom, definition, hypothesis, etc.). This is relevant for our topic, since many difficulties also in the sustainability debate are only a result of not having come to grips with this point. While practically everybody admits a limit, many believe today's basic beliefs will always offer possibilities of overcoming it (as in pragmatism, scientism, etc.); others know the limit but believe it is absolute since all currently used approaches manifest it (as in skepticism, postmodernism, etc.). But the limit is not absolute: it is determined by the categories in which knowledge and thinking is being thought. For disentangling this web we will have to get into some thinking of the philosophical sort, moreover one that goes beyond the habits of today's mainstream. But I will try to show that it can be done without needing previous philosophical knowledge. It is sufficient to face squarely the relevant points. This analysis paves the way for the approach I propose: 'systematic attentiveness,' covering the subject matter as well as the categorial instrumentation. It solves the crux by clarifying fully the nature of perspectivity and then developing systematically a special kind of concepts, which are strictly universally applicable within the chosen query perspective. They allow the new approach to be not only inter-disciplinary (useful for academic disciplines interacting), but trans-disciplinary (useful for general interaction—also with firms, NGOs, administrations, the civil society, etc.). For not remaining in abstraction I slip in some practical examples of where conceptual problems lead, taken from economics and medicine, as they are relevant to our topic: real sustainability. I close this presentation by outlining how systematic attentiveness can be implemented in practice. Since it is universally applicable, I will apply it first to the crucial point, the process of thinking, including the mind thinking itself—which usual approaches can cope with only in compromises. Then I show how it allows significant advances in traditional scientific fields, exemplified for the problem of sustainability by its own domain of debate: the geosciences.

In the Vein of an Introduction: Concepts and Their Relevance

Some might wonder why conceptual work should be decisive, especially since the currently prevailing

opinion is that any knowledge should be based on empirical facts for being reliable. The basic idea is that something must exist for being able to talk about it; clarifying first fully the instrumentation for thinking and talking about everything is still a relatively rare endeavor. In trying to find an orientation in the maze of the many perceived external things and internal emotions, in thinking and talking about them, people have since long been using expressions for characterizing them. But using them is not the same thing as being aware of their relevance in the cognitive process, which is necessary for constituting reliable knowledge as opposed to expressing mere belief. The problem is that any observable fact can be interpreted in different ways—more or less completely and more or less correctly, depending on the conceptual frame of reference. In fact, any description inevitably contains an interpretation, due to the specific perspective out of which it arose (any expression is said to be 'theory-laden'). The ultimately decisive element is always in the deciding mind—which must make sure, by considering fully the context, that its interpretation is adequate. For achieving this, the difference between the perceptual and conceptual side of the cognitive process is essential, and it can adequately be conscious only when thinking in terms that are finally beyond all observability, i.e., which are of conceptual nature themselves. For making completely sure, the structure of the conceptual side must thus be accepted as part of the necessary considerations. This endeavor constitutes philosophy proper—as opposed to (natural) science, which is dedicated to observation and description, not to purely conceptual considerations.

In the course of history, many philosophical theories have been set up about the conditions for warranting knowledge, differentiating aspects in the cognitive and discursive process. They manifest different grasps and understandings of the mental correlates of observed facts, which are understandable as a result of different foundational assumptions, and ultimately of varying degrees of self-awareness of their authors. Such differences appear collectively in the historical development of ways of thinking, in types of philosophy, but also individually, in differences between persons. Whichever way these differences may be structured, they can be assessed fruitfully only in purely conceptual terms. Wanting something existent as a foundation for assessing conceptual structures—as for instance in 'naturalizing' epistemology (taking results of natural science as a theoretical foundation), or in rooting mathematics in (mental) objects—inevitably engenders limits. They may not easily catch the eye, but will invariably limit the validity of the respective philosophical theory. In a pragmatic use of such theories their limit looks negligible, but it is crucial for complete reliability—as in needing a foundation for

overall sustainability. In a strict view it is not sufficient to remain in beliefs that worked till now, as this would only mean prolonging into the future a knowledge that was useful in the past.

Since orientation in the maze is a problem of types of order, it is not astonishing that the developed conceptual means finally address forms of order. This is not a presently prominent view, because the explanatory traditions have developed on the basis not of the explanandum ('that which is to be explained,' seeking to understand ways of handling types of order, which occurs also in types of order), but of the explanans ('the means through which an explanation is to be achieved,' i.e., the linguistic instrumentation for handling types of order). Philosophy developed historically in considering first the nature of being as what things are in themselves; this view does not cover securely the thinking agent itself, so then consciousness as the locus of thinking was contemplated; this view too does not allow all of the desired understanding, so lately the emphasis is on language as a general mediator. Although this is today's state of the art, it does not mean that the development can go no further. Presently the difference between language as a structural principle, the uses of language, and the ('preverbal') mental processes behind these uses, is coming into focus. The question is how the old border can be crossed.

When setting out from the linguistic instrumentation, the complex on the thinking side (autonomy, 'I,' personal identity, the psyche, thinking as an activity, etc.) looks mysterious, because the decisive part is an activity in choosing ideas (types of order) for putting them into material reality. Viewed 'from outside,' the act must seem mysterious or at best spontaneous, because its origin is directly evident only when one does it oneself in self-awareness (which may be rooted in perfectly clear reasons). Thinking in linguistic terms can 'see' only results, not the activity itself. This gap can't be closed by formal methods of any sort or amount, as formal logic can preserve truth in the logical steps, but not find or constitute any new truth. On its path the danger is to invent so many formal subdifferentiations that one 'ceases to seek the forest, being busy with all the trees.' Further down we will again come across the problems produced by thinking in instrumental terms, for probing this issue some more. The underlying thrust behind today's philosophical development, on its path of finding the ultimately relevant forms of order, is and remains therefore the need to make fully transparent the structure of the conceptual side. Whether one is aware of this need is quite another question.

Handling types of order has essentially two aspects: one of order in the world and one of order in the mind. This does not imply introducing a dualism, for instance

of a Cartesian sort, but that any lack of clarity implies a difference between two aspects, of which one is querying the other. Whether these two aspects can be unified is not prejudiced by this distinction. In broad brush strokes, the first side is marked by words like law, sort, structure, type, etc., the second by words like concept, idea, notion, term, etc. There are bridging elements, marked by words like content, meaning, order, etc.. The used words are less important than what is being meant by them—while the crucial point is that thinkers are responsible for their mental order, their interpretative structure, because they themselves build it up, albeit under social influence.

Talking about forms of order (laws) evolved in two traditions: universal realism encouraged thinking of actual order in nature (lately called 'truth-makers' of corresponding propositions); in parallel, and opposing universal realism, nominalism fostered thinking about statements concerning regularities, maintaining that forms of order (laws) don't exist as such. This second position, looking more tangible, has been dominating—producing a widespread imprecision in conceptualizing man-made laws and laws of nature (forms of order) by conflating order and involved agency. Then the overall order cannot be grasped whereby a combination is as it is, and not otherwise. Yet laws as such can't act in any way, they have nothing coercive in them. The question is whether one thinks about them on the level of everyday talk, or of complete intelligibility. Where a form of order is conceptually mixed up with the agency, the process is not thoroughly understood.

The nominalist view—whereby there is no objective order in the world, holding that all we have is statements concerning regularities—can of course be maintained, like any other belief, but at the cost of losing touch with part of reality, namely the mental and worldly agency. It is not only an incomplete view, but also an incoherent one: if there were no laws, no order in the world, as maintained, it would be impossible to distinguish anything from anything else. The fact that things are distinguishable, but just as they are, is a form of order. The question is whether one wants to admit an overall order, for then analyzing its substructure.

The tricky thing about pure forms of order is that they are a structure of content, balanced in itself, which looks different depending on the content implied in approaching it. Following, this aspect will become more explicit, using the law of the circle as an example: depending on the used conceptual elements in seeking to formulate a definition of the circle, the definition will look different; it is true within that perspective, but covers only the corresponding part of the implications of being a circle, while no definition can ever encompass all of them. And yet a thinking mind can refer to the pure law of the

circle—otherwise it could not reach any true conclusions in new considerations. Whether one is aware of a mental act (such as referring), or whether it occurs by dint of influences beyond one's full control (as in automatic reactions, or in obeying blindly a formal rule), is another question. The function of elements and structures of order in the mind—in short: concepts and theories—is to allow referring consciously to pure forms of order (for instance laws), for handling them adequately in processes of thinking and verbal interaction. The question is whether they can really warrant this performance. For example believing that concepts can only be of linguistic character, i.e., that no other elements can be relevant, confuses the material existence of elements with their structural necessity. As we will see later in this document, precisely those elements which are decisive for intelligibility—for example laws and forces—cannot easily be said to exist in the usual sense, even though they define the gist of existence of 'things'. Wanting to base one's considerations only on what is somehow tangible is not ultimately reasonable.

Few people realize that absolutely any content implied in approaching pure forms of order tint the impressions of what is being approached. Also the habitual gesture in philosophy and science of setting out from basic assertions (axiom, definition, hypothesis, postulate, premise, etc.) is such a content. Formally speaking it is a step of pre-determining something 'plausible' of the subject matter before it has been given the chance to present itself in its strict totality to the querying awareness. Namely formal systems, rule-based systems etc. inescapably embody this prejudicial character. But believing in 'plausibilities' limits the validity of the respective theoretical system. Due to its initial successes this gesture has been extremely attractive, in spite of its long-term drawbacks; it engendered the predominant abstract way of dealing with everything, irrespective of its nature—the gesture of administration, dominance, management, technique, etc.—and made computers ('that which obeys all orders') ubiquitous. The ultimate incompleteness of understanding, which this gesture embodies nolens volens, is the reason why we then are compelled to reflect back on our doings, wondering for instance about sustainability.

The difficulties in approaching pure forms of order appear also in today's concept of 'law of nature.' Quite generally, and in spite of its importance, the concept of law of nature is far from being clarified. Not being able to approach phenomena and the process of thinking them in one homogenous (i.e., universally applicable) conceptual framework led to a widespread belief that a multitude of types of laws (in the linguistic view: law statements) must exist—causal laws, laws of synchronic coexistence, structural laws, laws of functional analysis,

etc. (see for example Armstrong [1983], [1989], Earman [1978], [1984], Hooker [1992], [1998]). Hooker has put the crux as follows in the Routledge Encyclopedia of Philosophy in the entry "Laws, natural":

Some laws are inclusionary: all electrons have charge e; some are exclusionary: nothing travels faster than the speed of light in vacuo. Some laws are deterministic: f = m·a, Newton's second laws of motion, while others are statistical: given an incident UV photon, a skin cell has the probability P of dying. Some laws interrelate localized individuals (for example, the gas coexistence law PV = T), others concern field states (for example, the superposition principle, which has no equivalent among individuals). Symmetries, that is, invariance constraints, ground derived structural laws and may lie behind causal laws (quantum field theories). There is no single or simple relationship of laws to causes (of law statements to causal statements). ... Nor is there any single or simple relationship between laws and regularities (between law statements and descriptions of regularities). .... Conversely, empirical regularities have diverse relations to laws.

The distinction between order and agency opens a path to unlimited processual clarity: in nature, forces associated to an order produce material structures, and in the mind, the will of thinking must associate correctly the respective law with its condition of applicability. In this light it is amusing to hear for instance some physicists talking about 'changing laws of nature' and mentioning e.g., time, or the speed of light, as examples—which are not laws at all, but phenomena rooting in more basic forms of order. Based on the nominalist line, they developed a habit of calling a 'law' the mathematical notation of that law. But this entails its cost: one is then seduced into talking for instance about 'reversible processes' because in the respective mathematical notation time happens to be reversible; yet in reality no process can ever be reversible; a pattern may look the same again, but the constitutive bits of matter are changed.

Instead of thinking regularities in the countless events as accounts of how things appear, exist, vanish, and new ones of the same type reappear, the idea of regularity was thus reduced to those partial (mechanical) aspects that became known as the laws of nature—the laws of classical mechanics, of gravity, of thermodynamics, of entropy, etc. Applying such rigidified ideas, notions, and concepts, inevitably fragmentizes the view and counteracts the flow of life as a whole, constituting an obstacle for the completeness of understanding. To remain within physics for a moment, is for example gravity only something that happens between singled-out material objects? If yes, at the end of this line of reasoning, one cannot avoid postulating a carrier of this specific effect (gluons, gravitons,

the Higgs field, or maybe entanglement itself mediating mass). Then mass and gravity must look mysterious. Of course this line of thinking allows to develop theories that correspond quite well to empirical measurements; nevertheless it remains in the basically paradoxical nature of 'looking from outside at the object,' which can't warrant complete self-transparency because it can't encompass also its own act (not only in the quantum approach a 'blind spot' remains; this crux is discussed later.

Quite generally, the way concepts are usually being conceived, they have become traps for a process of alive thinking. Based on the presently dominant idea of life, scientists are busily searching for life all over the universe—but that type of definition excludes the possibility of recognizing other forms of life, even if they appear under one's nose. With narrow definitions, one can't realize for example that the most alive process is completely conscious thinking.

The point of concepts is to allow referring to types of order (e.g., laws) for handling them in processes of thinking and verbal interaction. As an example for handling facts through laws we can take the law of triangularity in geometry. One can define general triangles, rectangular and equilateral ones, etc., and all interactions, and believe to have captured neatly the problem of anything appearing in a triangular way (an analogy: appearing in a material way). But the point is that the law of triangularity actually means simultaneously the precise order of being triangular in structure and the freedom of allowing all possible triangles. These look different depending on the medium of appearing; the law of triangularity can become manifest only to the degree allowed by the intrinsic order of the medium.

Thinking geometry in a strict way means handling its conceptual elements in an absolutely clear way. Then the law of triangles reveals having itself two polar aspects: triangles can be approached either as three straight lines crossing each other, thus defining three points, or as three points that are joined, defining three lines (in analogy: wave or particle view). And what do you see in three lines crossing each other (not in one point)? A triangle? No, there are four of them, of which three go through infinity. Note that in infinity the triangular area delimited by a line changes sides; further down we will encounter again content that is polarized under the condition of strict totality. Paradoxes—also e.g., in the quantum approach—arise when the facts are not grasped conceptually in their infinity, i.e., when the completeness of interrelations is pictured somehow, but not in its strict totality. Today's science sees the phenomenal aspect of reality. But this is only one side; as mentioned, the conceptual side is at least as relevant: it determines the interpretations of the phenomena. In any complete view it is the decisive part

and should thus duly be considered. The complete law of the geometrical triangle, covering infinity—which is not only quantitative – does not invalidate any casuistry of triangles, but complements it decisively. In analogy, the complete law of materiality covers also the part which still remains hidden in 'complementarity,' 'non-locality,' the 'velocity' of light, the 'black holes,' 'dark energy,' and other limits in today's physics. For a truly complete understanding, it is not sufficient to encompass all objects; is it necessary to grasp also fully the categorial (and hence conceptual) elements that determine the chosen perspectivity. Not having achieved this is why for instance the quantum approach shows that observation must somehow be implied ('decoherence,' 'entanglement'), or in the relativity approach that moving objects must imply a mutual relation, while the respective physical theory cannot explain completely why and how this is the case. Categorial (and therefore conceptual) strategies that allow things to become manipulable—in the mind or in the reality 'out there'—embody the danger of self-deception by believing to be in control. Then errors are compelled to add up in effects until becoming empirically conspicuous—producing crises, and manifesting an inefficient research process.

For some these considerations might sound relatively unworldly, interesting only for a few wizards. But in fact they concern us all directly. So let us go through a practical example that shows the relevance of conceptual structures and is fairly clear to the open mind: the way resources are being handled, due to ideas—embedded in the currently dominating economic system and its theoretical foundation, economics—which determine the activity.

A Practical Example: Conceptualizing the Economic Process

Especially in the debate on sustainability, the notion of 'resource' is essential, but it remains vague. Since the Brundtland Report the distinction between biotic (alive) resources and abiotic (mineral) resources is being neglected—in spite of crucial differences in their characteristics (e.g., renewability and its cycles). The idea of sustainability is now being used for both types of resources, even though the mineral ones are clearly nonrenewable and subject to irreversible degradation (e.g., Georgescu-Roegen [1971]). The Western hemisphere owes its rapid rise to an extensive use of mineral resources. By allowing exponential growth, which abiotic resources can't permit due to their renewability cycles,

they nourished the thermo-industrial revolution. The new habit—widespread especially among economists—of not distinguishing adequately between the two resource types, talking only about 'natural resources,' allows to maintain the illusion that exponential growth can generally be sustained even though the technically induced entropic degradation, and the transfer of lithosphere material into the biosphere, are of course limited. The unclear conceptualization was pushed into wide acceptance by influential agents, pleased by a rosy picture of eternal economic growth.

The self-deception is no accident, but the result of a technological path-dependency based on a belief that institutionalized property rights (ownership as power of disposal, 'Eigentum')—which allow for instance to sell and purchase goods—can constitute a generally sustainable order. Many forget that this aspect of property depends on a more fundamental one, namely possession rights (ownership as entitlement to use, 'Besitz') due to competences in dealing with things. As an institutional pillar, property has two economic potentials which entail a hierarchically ordered logic of decisions: as an entitlement to possession, property defines rights of use by competence; as an entitlement to dominion, it offers security (under mortgage) in credit contracts, allowing property societies to create endogenously the institution of money in a specific way. This contract structure has a strategic value through the pressure of contractual indebtedness, which stipulates a repayment within temporal limits, burdened by interest on capital and defined according to the monetary standard of the creditor. This structure explains why vested monetary interests call for 'ownership society,' but not for acknowledging implicitly engendered burdens, making others carry them. This conflict arises by splitting off competence (understanding as regards content) from property (formal dominion).

In dealing socially with objects, the way of handling the difference between possession and ownership determines on principle any economic system. Agrarian societies usually operated on the basis of possession in the cycle of biotic resources (which are renewable) for agriculture and energy; this made the process sustainable. The situation changed with the emergence of industrial society and the invention of property rights. Industrial society made extensively use of mineral resources (which are not renewable)—and then became addicted to their characteristics. The corresponding institutional framework will thus naturally favor two types of technology and social engineering: those enabling a direct translation of its structural pressure into material production (essentially the thermo-industrial methods, which allow exponential growth but impose entropic degradation and pollution); and in the domain of non-exponential growth

those methods which permit possession structures, accumulated in the past, to be converted into structures of future dominion (biotechnology, privatizing water sources, transferring collective knowledge into 'intellectual property,' etc.); for instance an interest in species diversity can then exist only insofar as nature becomes instrumentally exploitable. For an analysis see Steppacher in Bieri et al. [1999], contextualized in a discussion of modern agriculture.

Any institutional framework based on property rights (not possession rights) can't avoid making everything into a commodity, forcing new markets into existence and imposing the standard of monetary decision-making. The latter engenders itself an exponential type of growth by the way money is being institutionalized: not as a means of free exchange, but itself as a commodity, with a price for being used. In this way, money can be made out of money—a seductive idea for many. Money is being put in circulation through a primal debt, by central banks crediting commercial banks which then credit individual borrowers. Following the logic of property (not possession), the central banks were gradually all privatized. At each step the debt inevitably increases (since everybody on the way wants his part of the cake); it shows in the interest rate which forces borrowers to pay back more than they had received. This debt burdens all facilitated infrastructure for production; as a side-effect, prices of goods contain an increasing portion of cost for paying back the invisible series of debts that allowed to produce them. The reality of today's global monetary system is not full freedom, as many believe, but coercion organized in an imperceptible way. Everybody is subject to it; whoever manages to operate close to the monetary origin is not free either, since being there requires endorsing beliefs that don't allow to overcome on principle the system.

This system and its money is burdened by another theoretical problem: goods are valued (and hence measured) in monetary terms, while the value of money is measured via the total amount of goods (the 'domestic product'). One accepts thus 'A is a function of B, while B is a function of A,' which would not get mathematics very far. Applying this questionable basis (the domestic product), combined with subjective value theory, leads to a valuation of money that coerces agents, through the competition on the monetary market, into following the rule of return on investment. As a result, money can never become a free medium of exchange that serves everybody in equity: the 'big' capitalist always has an advantage over the 'small' one.

What is currently being called 'globalization' is essentially a process of globally imposing property conditions, which entail corresponding techniques and technologies. This process is obviously not sustainable in a strict sense,

but the conceptual basis of mainstream economics does not allow the insight that the process stands on an ice floe that is melting away under our feet, while most of the critique of globalization is based on vague hunches. Solving the problem requires a solid knowledge of the conceptual structure that produces it. All its aspects are a result of mere assumptions and thus purely conceptual distinctions; therefore no amount of empirical work on this basis can ever amount to any uncompromised solution. In the face of its challenge, economics sought to secure its methods by means of mathematical rigor. But no amount of handling empirical data with sophisticated mathematics can ever bridge the induced gap in fundamental content. As Geoffrey Hodgson [2004] has put it succinctly, discussing a critique of mainstream economics by Mark Blaug and Tony Lawson: "the victory of technique over substance is a chronic problem within modern economics." Basing the abstractions on empirical data allows to grasp some of what has been done until now, but not the overall law of ecosocial process as a whole and—based on that—an insight into the way things should be. Accepting what has been done until now as the order to be followed in future is one version of the 'naturalistic fallacy': in spite of widespread beliefs, no 'is' can ever constitute a sufficient basis for determining the 'ought'. In following this path, one finally produces an inflation of words, which may sound like justifications to the credulous but must fail in complete reality. An economics allowing 'laissez-faire' finally fosters the law of the jungle. By prolonging habits of the past instead of achieving fundamental clarifications, mainstream economic thinking has allowed moral weaknesses to thrive—to the point that agents in the resulting system became psychologically dependent on them. This shows in needs of publicity to keep consumption going, or in the irrational pursuit of economic growth due to an addiction to high returns of investment. By its type of approach, such a theoretical system can't contribute directly to moral strength. Tougher ethics can't lead to a real cure, because the morally conditioning influences reach more deeply than such correctives can ever handle. Under such conditions it is no coincidence that only few cultivate an understanding of life, and the respect for it as a whole.

The biotic resources and their particular qualities—impossibility of exponential growth, restrictions in time use due to renewability cycles, hence an impossibility of utilizing fully the production capacities, and a relative unattractiveness for monetary capital seeking returns on investment, etc.,—led historically to incompatibilities with the logic of property. The sheer dependency of society on biotic resources has made necessary some restrictions of this logic, for example as rural rights of inheritance, environmental and developmental planning,

subsidies and protective tariffs. The actual dependency leads to double-faced official reactions: on the one hand proclaiming rules as stipulated by the WTO, on the other hand trying to maintain a protective agenda. Property is a reasonable relation for handling inert entities, but it produces tensions—thus reducing the overall efficiency of the process—when dealing with alive ones. Wanting to manage scarce resources instead of fitting the man-made process into the natural process, any exploitable potential is being called a resource, encouraging boundless pillage. But resources being scarce is not as primordial as their being available in nature's organization. Imagine living on a barren rock! In agriculture, introducing industrial technology up to genetic manipulation can't offer sustainable solutions, as it shifts the problem to other realms by not addressing the overall law of the process. A problem can become invisible in a theory, but conflictual results finally always call us back. Some aspects of the real solution have always existed, but were pushed aside by powerful interests vested into the logic of property. They can be found from works in the Marxian tradition to Veblen [1919] and modern ones such as Steppacher et al. [1977], or Heinsohn and Steiger [1996].

Problems stem also from neglecting the distinction between the use value and the exchange value of goods. Adam Smith eliminated the use value as a result of thinking in terms of trade, believing the exchange value reflects adequately all of economic reality. One consequence is the 'diamond-water paradox': why are actually useless diamonds expensive while water, essential to all forms of life, is cheap? Believing the value of goods is determined by what the agent is ready to trade in (the imaginary values of 'subjective value theory'), overlooks the real value (or use value), which determines existential reality and hence also politics. This view forgets the law of nature that governs all forms of economy: the act of setting resources into value is the necessary and sufficient condition for carrying the whole economic process and constitutes thus the fundamental form of capital, prior to any subjective assessment (in monetary or other terms) and to activities like saving or investing. Usual forms of economic value—property, monetary capital, interest, means of production, labor, human capital, natural capital, etc.,—are secondary, a juxtaposed layer of imaginary values (Schaerer [2003b]). This intrinsic overall law of the ecosocial process contains as aspects the usual laws of economics (e.g., production function, law of diminishing return etc.), and governs all economies—irrespective of being subsistence toil or high-tech, involve money or not, are capitalist or socialist, growing or recessive, etc. Due to its 'enveloping' quality, this law is a solid basis for determining the real value of money—in contrast to the intrinsically limited considerations via the social product.

Since theory did not discover the law of nature that governs all forms of economy, it could not optimize and harmonize the economic process out of a secure overview, but had to take archaic pseudo-optimizing features such as personal interests ('homo oeconomicus'), the need to know ('complete information'), or the need to survive ('competition') as allegedly relevant theoretical elements. Once the idea of exchanging goods is chosen as the theoretical basis—not the ecosocial process—the whole can be grasped only in its trade and commerce aspect. As a result, all income must be squeezed out of this type of activity while the theory excludes sources and sinks of the process, locking them up in 'ceteris paribus' clauses. Theory sacrificed the overall advantage of division of labor to its one-eyed view, and allowed survival to depend on squandering resources, producing ever more scarcity: now all agents are coerced into the role of the (entrepreneurial) middleman for ensuring their subsistence by fighting for income. Consumer prices may be lowered a bit in this way—but at a high social cost which no traditional balance sheet reveals. Now the sectors of the ecosocial process that can't offer quick returns on investment because their efforts become appreciable only in the future—e.g., agriculture, education, health care, the social process called 'the state,' etc.,—suffer from a shortage of investment (money). Probably nobody wanted money to become scarce in these sectors, but this is the systemic result. It would not occur on the basis of the said law of real value, which is generally valid, even in a universe of purely mental matter, in mental economy: the necessity for future cognition to produce first a set of mental representations (a language), is of the same order, since the use of signs is necessary for organizing the ever-new process of cognizing (fig. 3).

The point is that all the decisive elements of this structure follow from purely conceptual distinctions. Any empirical element enters the scene only in ulterior steps. The real solution therefore is in a fully clarified conceptual basis. There is an increasing debate on weak points of the ruling type of economics—for example in Daly [1996], [2001], McCloskey [1996], [1998], Ormerod [1997], Galbraith [2000], Keen [2001], Bernstein [2001], Nelson and Stackhouse [2001], Rees [2002], Stiglitz [2002], Lee [2003], Fullbrook [2003], [2004], etc..

So much for economics as symptomatic example of a doubtful conceptual foundation. The problematic point, namely belief, can obviously not be eradicated from social interaction—especially in everyday life. For instance in a foreign town, inquiring about a location requires believing the informant. This is fine in pragmatic situations where following an erroneous path implies no danger. But, in scientific theories, belief as a basis should have no chance at all. Not only can it lead to erroneous

knowledge, which is a general social good that endangers others when it is unreliable. Beyond this aspect, not noticing the problematic conceptual foundation of a theoretical structure is methodologically inefficient, because the phenomena then impose—through their intrinsic interconnectedness—ever more subdifferentiations and classifications, ever more detailing (many believe this to be progress because of clever-looking casuistries and mathematics). Nevertheless, the substance of the distinctions can fall into place only when it can enter the considerations in a non-adulterated way at the primal level of conceptualizing the problem as a whole. In principle, philosophy and science are our institutions for doing so.

The Symptoms of the Problem, in Philosophy and Science as a Type of Endeavor

The objective of this symposium, seeking to ascertain everything relevant for sustaining resources, is only a partial problem of philosophy and science, but reflects all basic issues. It is a challenging endeavor already as such: whatever field one studies—ecosystem parameters, climatic dynamics, policy making, techniques of management, measuring, monitoring, etc.,—at the end of a line, the more one is involved, the more something at the edge must be given up for not getting lost in a maze, while the real problem is nevertheless connected to just about everything else on this planet. Those who do not approve of the sacrifice might wonder how such a bag of fleas can ever be contained in a rational conceptualization that is peacefully beyond the paradox effects of observing and describing, or the fuzzyness of mere probabilism which characterizes today's widespread emphasis on quantity and statistics. Thompson Klein [2003] offers a good overview over the current debates in the wider earth sciences. But can science, as a way of proceeding intellectually, ever be secure and thus sustainable on principle? How can we clarify this point, which finally implies complete self-referentiality?

There is obviously a problem of true science versus mediocre science, but the criteria for distinguishing them are far from being obvious. Some believe 'sound science' is distinct from 'junk science' by knowing how to measure correctly—where the problem remains of how to ascertain (in this view: measure) the instrument, namely science itself. Others emphasize the value of 'thinking big' (i.e., beyond usual limits)—but can propose only pragmatic hopes, no systematic guidelines, so one never knows whether one is slipping into 'thinking grandiosely,

but slightly wrong,' or even 'thinking bloated.' In the contemporary mainstream, the ultimately objective criterion for strictly complete and secure science remains an unsolved issue.

Such gaps are no coincidence, but only the result of how philosophy and science in general are now structured. At first glance they seem to constitute a very pluralistic network, but this is only because a common feature is not duly recognized, whose effect glues them all together: they all set out from fundamental assumptions of whatever sort. As this inevitably is a way of 'talking' into the overall interconnection of content before it has been given a chance to unravel as a whole to awareness, they wind up in problems on principle—for example undecidability (remember Kurt Gödel, or the continuum problem), or uncertainty (as e.g., Edmund Gettier has revealed), or indeterminacy (as e.g., in quantum theory), or paradoxes (e.g., the 'blind spot' of systems theory), etc.. Philosophy ended up in ideas such as the 'Münchhausen trilemma' (formulated by many from Agrippa to Hans Albert: any justification or account winds up in a circularity, an infinite regress, or a dogma), 'écart' (Merlau-Ponty), 'différance' (Derrida), etc. Such notions formulate an aspect of the general limit, depending on the basis of the respective approach. The basic gesture of positing an idea, however 'plausible,' has more consequences than we are commonly being told. Whether an assumption is conscious and rational ('atomic fact,' axiom, definition, hypothesis, postulate, premise, etc.), or emotional or unconscious (anxiety, belief, desire, hope, illusion, paradigm, etc.), does not modify its effectiveness. The difference between rational and irrational prejudices is only that rational ones allow logically consistent systems to be set up. But even the strictest logical consistency can never warrant any actual completeness of grasp and certainty. The completeness in formal systems is far from covering reality. In language-based considerations, completeness and certainty inevitably must look like a quantitative problem of getting hold of all relevant propositions. But the core issues can't be solved there.

The limit is not unknown, but discussing it within the mainstream leads to results that are not ultimately dependable: a knowledge within limits is also of limited validity when it judges the limit itself. This restricts the real sustainabilty of mainstream science, because within it one cannot know where the problem finally is. This is not to say that the limited theories are simply wrong. They do offer successes, at least at first, when manipulating 'things,' including one's own mind. Achieving effects through manipulation still is attractive worldwide; hence many accept the belief that this is a beneficial path, and the powerful nourish the sources of manipulability.

Attitudes such as technocracy, materialism, or consumism are no coincidence, but effects of a locally rational behaviour that is globally irrational. The corresponding results include a reduced overall sustainability. The question is: how can we find a viable solution?

One can choose not to care about theory, for proceeding pragmatically; this is widespread. But whatever the basis of a pragmatism may be, it can never offer a systematic basis because it takes for granted the overall order instead of being able to explain completely its structure. Pragmatic stances lack precisely the kind of knowledge that allows for secure sustainability. But one can wonder and take seriously the nature of basic assumptions and beliefs. Where this is not done, science can become a tool for eluding one's responsibility for totality—in this case: thinking about thinking—by allowing to escape into ever new fields of 'progress,' 'truth,' and 'knowledge,' instead of fully facing the crucial issues: that (a) everything appears to us according to our primal distinctions (problem of categoriality), and (b) we can't stop thinking, but we always direct it by accepting the focus of our attention (problem of intentionality); even when we believe we do nothing we always direct our flow by the focus we accept. Any bias has its effect. For example believing that nature basically consists of mechanisms will yield the corresponding theories and scientific models, which have their grain of truth, but also their limit of validity. By the way, nature can be thought in a totally organic way without needing the concept of a Supreme Creator, as for example in the process philosophy of Alfred North Whitehead ('systematic attentiveness' constitutes a viable alternative).

Seeking unification by addressing totality is typically the aim of religion. Since classical antiquity there have always been two strands of this endeavor: one seeking a rational grasp of the conceptual means for handling strict totality, and one of seeking the kind of insights that allows to dispense revelatory knowledge. Acquiring these insights requires discipline in mental openness, which may seem superhuman; especially adepts of some mystical traditions believe thus it is possible only by 'stopping to think.' The point really is in what is being meant by 'thinking.' Certain psycho-organic techniques allow to block the mental process, which nature re-equilibrates in 'breakthrough' experiences of mental light (hence the name 'enlightenment'). These do not prove having stopped the mind as such, however; they are the result of immense mental efforts while the subjacent organizing activity remains, unnoticed. Yet such impressive experiences reveal—even if only for the short moment they last—the overall structure of the mind in a special state, in which the (blocking) doer and the (blocked) result seem to be one and the same, because they mirror each other.

The question is how such acts and experiences, and the memories they engender, should be interpreted. One of the profound realities to be understood is the mirroring quality of the mental realm. The use of mental blocking techniques may finally lead to certain quite deep insights, but how can we be sure that they really cover absolutely everything? To be convinced by an experience is still a form of belief, not yet the guarantee of a complete understanding. It is helpful to distinguish the basic gesture of belief or what I call confessio (belief in foundational ideas or statements, which lead to mere professing and declaring) and the principle of religio (the rational gesture of 'connecting to the whole,' the basis of secure insight). The point is that staunch belief can only end in dogma, producing new forms of wars of ideology—the 'tower of Babel' problem. In the last instance we can't escape the need for conceptual (or rather: categorial) clarification—which does not mean, however, that habitual ways of conceptualizing the act of conceptualizing have been adequate.

You might notice that I do not only offer abstractions. I address also the practical view of self-referentiality by speaking about experiencing your own doings in your own mind, not just rashly using it and taking for granted its functions, in this way reducing it to a mechanism, a mere slave. Instead I encourage the integrity of being completely aware, also of what happens in your mind. At first glance this method of your experiencing your mental activity might look like mere subjectivity. But let us be precise. The point is that the conditions for achieving any objectivity must be produced by the subject—in this case you. Personally producing adequate conditions for objectivity to be able to express itself is not a contradiction. The question is how can this reliably be done? what is the locus of ultimate objectivity? Instead of expressing a hypothesis, at this point I propose to work through the ways in which objectivity usually was sought, and the ways in which they have failed. On this path we can learn something also about the nature of objectivity.

The Produced Limits in Actual Knowledge

While the fundamental cause of the exposed limit in the hitherto usual methods for gaining knowledge is in the habit of setting out from assumptions, this habit led to a series of several structures that are causal for fragmentizing and limiting end effects. A splitup—as the final consequence of presupposing ('talking' into the issue as a whole, instead of 'listening' into all of the interconnectively relevant content)—can take many shapes, the

study of which can reveal some of the mechanism of self-limitation.

An important feature of assumptions concerning ourselves as cognizing organisms is their absolute and precise effectiveness. Believing for example that 'X is unknowable,' or 'the mind is an Y,' or 'complete integrity is unattainable,' actually makes X unknowable for the believer, allows only Y-type characteristics of the mind to be known, and will foil complete integrity indeed. Believing for instance in the results of the cognitive sciences and neurosciences is of this type that fosters self-estrangement; not computers are dangerous to society, but people who robotize themselves. Knowing about this type of limit is exact as soon as one knows the self-oriented presuppositions, since they operate 'from within' thinking. Presuppositions that determine the mental process, through which the mental process itself is then being judged, can evidently have no other effect than precisely what their content dictates. The less one is aware of the presupposition, the more easily one will slip into the circularity of an addiction, but becoming aware of it removes the spell (for example psychoanalysis works in this way). In contrast to this precision of content, any knowledge that is based on observing processes 'from outside' can never reach the respective core—as Kant had to state concerning his 'thing as such'—and therefore can yield only probabilistic results, in which the single case and the covering law (the overall order of phenomenon) elude the method. The widespread turn of late towards statistical methods is no improvement, but a concession to the drawbacks of external observation because it has become ubiquitous. The insight is crucial that these limits or split-ups are all man-made. A belief does not become objective by projecting the respective fantasy into its medium of appearance, as for example Churchland [1994] does, concerning causality:

> "Electrical current in a wire is not caused by moving electrons; it is moving electrons. Genes are not caused by chunks of base pairs in DNA; they are chunks of base pairs. Heat is not caused by the movement of atoms, it is the movement of atoms ... [and in the same sense] awareness just is some pattern of activity in neurons."

because this seeming objectivity merely shifts a basic lack of explanation into ever smaller 'pieces,' onto ever new levels of mystery, producing new splitups. Many call this progress, because new elements seem to become accessible. In such attitudes, what reality ultimately is—in Churchland's case: effects in matter, beyond its finite bits and pieces—is not being clarified. Especially philosophers give up their credibility when they give up the objective of ultimate clarification, in this case succumbing to 'naturalization' (believing blindly in natural science).

A splitup can result from confusing the modes of language and fully coherent thinking. This difference was blurred by the 'linguistic turn' (a widespread turn in philosophy, based on the assumption that thinking must be structured discursively, if it is to be rational). In its heyday, reviving the distinction must sound like blasphemy to many. But their god is, as we saw, not firmly in his saddle—held only by belief, not secure knowledge. Saussure proposed a useful distinction between language as a system ('langue') and the use of language as an alive process ('parole'). Spoken 'parole' is always beyond structural 'langue.' But for clarifiying fully the issue, language as a principle must be considered in a wider way than what is proposed by the linguistic approach, because it is centered too much on the signs and neglects thus the core: the signified content as such. Once one is stuck with results of thinking content (propositions, signs, etc.), the adequacy of an expression (often this is called 'truth') can only be measured within language against reality, in a procedure that requires thus another linguistic element (or a network of such), because reality does not respond directly. But then any investigation has no anchor in overall reality, it can only float on the sea of purely man-made, intersubjectively agreed opinions (beliefs). This method can offer no warranty against collective error, while it neglects a structurally fundamental difference between language and thinking. Consider the following basic regularity. Within language any contradiction can be formulated, from 'straight is curved' and '3+5=9' to antinomies like 'I am lying,' up to voluntary deception—while it is impossible to think such linguistic structures in one single coherent thought. Whoever adopts fundamental beliefs that lead to some paradox is compelled—for accommodating it coherently—to remain within the corresponding set of elements (signs) that are intrinsically interrelated according to the causal prejudice. But 'interrelation between a set of signs' is the intrinsic law of being a language system (Saussure: 'langue'), not mere noise. Sticking to beliefs produces thus a dependency on 'langue' for keeping together the assumption's effect. Without 'langue' everything would fall to pieces for this psyche—but it cannot remain only within it, because 'langue' can contain only the past. Life is pointless when restricted to unalterability; this is why spoken 'parole' is always beyond structural 'langue.' For example, using the personal pronoun 'I' can be authentic (in psychic integrity), or false (when remaining in 'langue'); fully understanding the self-referential unity of personal identity requires transcending 'langue' and is thus possible only in pure thought, considering content

as such. Language offers a surrogate for perception, allowing to deal with what is not physically present. It is not the basis of all of thinking, even though many people are indeed conditioned to ways of thinking that remain in a mental use of language in forms of 'talking to oneself.' The question remains of how thinking can be sure of its dealing with reality, beyond anthropocentrism. The call for justifying beliefs, as must be postulated upon following the 'linguistic turn,' is no ideal solution but produces a fateful dependency on intersubjectivity and makes theories into cobwebs of hypotheses. As stated in the Duhem-Quine thesis, a single hypothesis can't be tested in isolation, because all others are implied too; inversely, by sufficiently modifying those, practically anything can be made to sound like being justified (e.g., Davidson [1984]). A connection between problematic suppositions and a subsequent addiction to language is not limited to individuals, but can arise in styles of writing or of politics, schools of thought, philosophical or scientific positions, institutions, etc. In this light, 'publish or perish' is perilous, as it engenders a semiotic infarct.

A splitup can also result from an emphasis on measuring appearances, thus losing contact with the overall order according to which they arise, exist for their time, vanish, and reappear renewed in what can be called 'the four seasons of being.' The centerpieces of intelligibility, i.e., the conceptual elements that determine a real understanding of appearances—for example laws and forces—are not observable and hence not measurable as such, but only their effects. The decisive elements can be grasped as such only in thinking, and even then only under the appropriate conditions. Nevertheless, the idea of measuring has practically been made into the guideline of today's science. What can't be measured is left up to thinking in terms of 'values,' which can never reach beyond a certain vagueness, or to religious considerations. Yet thinking in terms of measuring injects a specific content into the research process: a comparison with an alien element. Measuring is indeed possible only after having posited conceptually an element of reference, which cannot avoid embodying some arbitrarity; this element explains why for instance the measurement problem of quantum theory—often hailed as the only fully secure theory—can't be solved materially in a strictly complete way. In the course of its development, this theory has led to a hunch that matter finally does not consist of fundamental pieces (even if entities do exist, but only for their duration of time). The separability of physical systems—an idea that even Einstein never gave up—had thus to be abandoned. But the separability of observables (such as location, velocity, spin, impulse, etc.) was kept; these are what is being measured. The result is the paradox features of this theory: At the 'small'

end it features an indeterminacy that can only be shifted into 'new' areas (e.g., of time or space), and at the 'large' end it is conceptually compelled to postulate 'emergent' features of objects; complementarity arises at the 'observable' end, and nonlocality at the 'relational' end, because matter does indeed not consist of basic pieces. The idea of 'entanglement' illustrates the conceptual problems, but has no explanatory value. The theory is always correct, even in counter-intuitive setups—but because of its paradoxes, or more precisely because of the conceptual basics that generate its paradoxes, the results of this theory always require an interpretation. Currently there is about a dozen of them, but none is strictly conclusive. In spite of its correctness in any given material setup, even the quantum approach is therefore not an adequate basis for unifying knowledge. Prolonging it into the theory of self-organization ('autopoiesis') or complexity theory (as in the Santa Fé Institute) does not solve the issue, but only shifts its 'blind spot' somewhere else.

Another version of the splitup results from hoping to achieve objectivity by approaching things 'from the outside', following René Descartes' idea of separating mind from matter for understanding reality. In this vein, even the functions of the mind have been subjected to the seeming objectivity of a functional view, expecting for instance reason or perception to work like mechanisms. Whether the seemingly objective gesture is one of distinguishing, observing, describing, measuring, or intervening, is finally irrelevant: it is always one of comparing the subject matter with something else, alien to it. This gesture inevitably creates a corresponding 'blind spot'—for example an observer can observe everything except his own act of observing. Logicians discovered that the blind spot cannot be discovered from within the system: The system can't see what it can't see, and it can't see that it can't see what it can't see—namely the paradox that the system, splitting up the universe between system and environment, must on the one hand be distinct from this distinction, while it must on the other hand exist within this distinction as part of the whole and hence as an object of investigation. In this paradoxical situation, observing other observers in their activity of observing can look helpful, but the blind spot can never be overcome, it can merely be shifted around (Luhmann discusses this aspect eloquently in his systems theory, but can offer no solution on principle). Whether one considers material things or mental elements, is irrelevant, because both are not the respective order as such, but only its manifestations and hence appearances—in the external world or in the mind. In this context it is useful to remember that mathematics can never offer more than a description, as it is only a language, albeit a precise and completely formalized one. Especially in its algebraic branch, mathematics can

never get rid of its language status because it is formal: the symbols stand for something else. The syntactic information 'hidden' in a language should not be expected to yield new truth just because it leads easily from one logical step to another (a fallacy arising often e.g., in physicist's or economist's thoughts). Terms in an equation take their meaning from conceptual attributions in that application, not only from the interrelation between terms. Remaining within a system (i.e., way of thinking) that is not totally clarified, can finally only suggest an arbitrary move—an auxiliary hypothesis, etc.—for 'outgrowing' its drawback at the edge. Such epicycles make the problem reappear in a 'new' area; in this way, e.g., agency has forever been sought in ever smaller 'basic elements', even though inert matter can't really act. The nature of today's mainstream is indeed fundamentally conflictual, making it into part of the problem rather than its complete solution. Its fundamental problems are usually not being solved, but only avoided. Sometimes evasions look extremely successful at first—in logics for instance Tarski's approach to the concept of truth, seeking to avoid formal paradox by introducing meta-languages, separated from the object-languages—while in new perspectives any meta-language is again an object-language and the meta-language of all meta-languages is everyday language –; or in type theory (Russell and Whitehead), segregating propositional properties, relations and sets, into 'types'—which does not clarify the ultimate basis for, and effects of, performing this type of segregation –; or in Spencer-Brown's protologic based on the primal act of distinguishing—with its problem of 're-entry' because distinguishing presupposes distinctions, otherwise there would be nothing to choose 'primally.' As outlined above, the gesture of trying to escape engenders the structure of language and 'justification'—as opposed to the unifying effect of integrative thinking. Thinking is the process of relating to forms of order, producing linguistic elements. Hence the question is how to think order as such, not only how to get along with appearances and talk about them.

Here we are not denying that knowledge can be unified to quite an extent and under many banners, for instance under measurement, statistics, or language—in the same way as many definitions and theories of a given phenomenon are possible, which moreover need not exclude each other. For example the pure order (law) of the circle in plane geometry can be approached and defined in many ways, manifesting different types of interest: in terms of distance from a given point, or of curvature, or of the rectangular point of all triangles over a line, etc. (fig. 1).

Or in today's physics, matter can be approached via the quantum, relativity, nonlinear dynamics, quantum field, string, or any other perspective. Again one is coerced by the type of interest, determined by what one wants to measure—the infinitely small, or movement, or changes in appearance, etc. All these approaches rely on the 'mental gesture' of measuring—but none can offer a complete understanding of its object's intrinsic nature, because they all operate in categories that are inadequate to the respective overall order as such, in this case of materiality. Whether they finally are verifying their theory, or caught up in some self-fulfilling prophecy, is empirically undecidable, since any setup considered in the language of measuring always reconfirms this language, but its blind spot remains. Setting out from preconceptions is a sure-fire path towards finding only aspects. This is why contemporary physics cannot get together all its theories in a strict way. Achieving this requires complete clarity beyond any specific object-orientation: purely categorial work. Operating within distinctions which stem from measuring can on principle never yield a complete understanding of the intrinsic nature of matter, because they inevitably introduce an alien element. Remaining on paths that can only ignore the ultimate nature of matter, while professing a 'materialism,' is thus something rather oxymoronic, in spite of being very widespread. It is in fact an idealism (or rather a fantasism), because one sets out only on metaphysical beliefs. Being able to
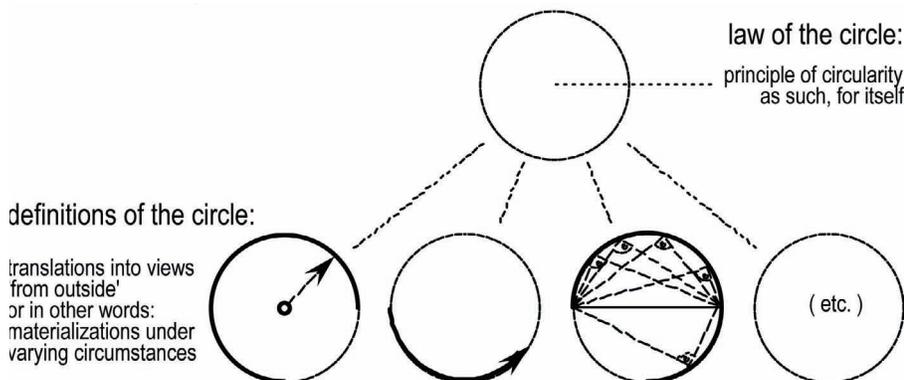

law of the circle:
principle of circularity
as such, for itself

definitions of the circle:

translations into views
'from outside'
or in other words:
materializations under
varying circumstances

(etc.)

Figure 1. Lawfulness and its material appearances N in mind as definitions, in material matter as specimens.

manipulate matter according to found laws is no proof of complete understanding: any animal can produce change without needing to know all of why the desired change occurs. This loud call for ethics of late is due to this gap. In the end the problems are always on the cognitive level: also the moral philosopher must understand why some idea or action is good or not. The question is on which channel the universal laws are being referred to, for commitments to be generalizable.

A noteworthy point is that the centerpieces of intelligibility, i.e., the conceptual elements that determine the full understanding of appearances—for example in a processual approach: laws and forces—are never observable and thus not measurable as such, but only their effects. As the example of the circle shows, the means for intelligibility become propositional only upon being approached from a perspective, i.e., upon being interested in them in a specific way. As such, forms of order are nothing but themselves. This is not in contradiction with the fact that they can be characterized by their content, which interrelates with the content of all other forms of pure order, up to the overall order of the universe. For the intelligibility of order, conceptually polar aspects are relevant. Polarities are total opposites; appearances (materiality) can't be manifestly polar—simultaneously also immaterial and still material –; therefore materiality displays dual aspects (e.g., symmetries in physics and in living beings). Judging a form of order is not being that order, unless the act of judging conceptually is purely that order. A comparison with an infinitesimal alien element may seem negligible, but always has its price on the level of strict totality: a paradox, a gap, a (self)-limitation in the theoretical understanding. Struggling for complete transparency (which can be called truth) always makes sense, while material strife is finally always pointless.

Methodologies based on assumptions allow a certain degree of sustainability, reflected in phrases like "sustainability of what sort, for whom" etc.. The multitude of partial truths then becomes a problem: how should they be unified? Beyond that, aiming at real sustainability merits a better grasp than adding up piecemeal results. Seeking the 'optimal assumption' won't solve the crux, because any presupposition inevitably compromises the respective approach. The question is with how much (un)certainty one is ready to acquiesce. This in turn depends on the choices one has. We saw that wanting to grab the overall order in appearances, even in what appears in the mind, leads imperceptibly to a loss of what one is ultimately aiming at. There are better choices, but they are barely ever thought of. This is the tragedy of our times.

For determining types of knowledge which allow a secure overview, ideas for 'logical', 'metaphysical', and 'moral' certainty were proposed, but there is little assent on the whole. Mittelstrass [1982] distinguishes 'knowledge for the sake of orientation' vs. 'knowledge for the sake of action' ('Orientierungswissen'/'Verfügungswissen'). But he too does not base the more complete type of knowledge (seeking/offering orientation) systematically in a universal way; in spite of his intention he remains in the linguistic turn and its intrinsic self-limitation.

For closing the gap I propose a completely uncompromised distinction, namely between the language of intelligibility and the language of manipulability. The first consists of laws (forms of order, pure structure), which we grasp by means of concepts, ideas, or representations that can be communicated by using names and predicates; all forms of understanding are ways of grasping the ultimately relevant order. The language of manipulability consists of names and predicates ('handles' for catching 'things' in representations). At first glance it seems to allow complete intelligibility; only upon thinking through the network of all names and predicates, one can notice that it can't cover strictly the whole, that something is missing somehow, can't fully be understood, or produces surprises. Remaining in the language of manipulability impedes knowing just what goes wrong. An example is causation—think e.g., of the 'covering-law' type of explanation that can't allow to know on its own whether the explanandum is causally effective, or a necessary condition, or an inevitable concomitant element. The distinction of two 'languages of thinking' is similar to Mittelstrass' of two types of knowledge, but more promising, as he offers no proposal for overcoming the language of manipulability. Remaining within it while believing it can serve as language of intelligibility logically must lead to believing the encountered limit is absolute—while only the belief in the language of manipulability is absolute. Such knots are unnecessary. The failures they produce often are noticeable only much later. Many need to experience failure for wanting to learn, but it's more efficient to think clearly beforehand, addressing the fundamental issues. This is the substance of culture.

The Ideas of Mechanism and Organism as Mirrors of Sustainable States

In a figurative sense, problems of sustainability can also be viewed as problems of overall health and disease of systems and even of theories—healthy in the sense of being sustainable, where noxious influences call for corrective action in the same sense as implementing a

cure for inducing a healing process. One can question the rationality of this analogy, since the patient in nature is not as evident as the patient in medicine, and theories are rarely viewed as something whose correction is in fact a healing process. But are these the truly fundamental points? Already in the traditional medical situation the question is whether the interconnections can be grasped in an ultimately valid way. After all, medicine is held to be part of natural science, while no process is healthy or unhealthy per se, but only in an organic context. What does this context encompass? All physiological data, or also the process of body regulation? Only once the very principles are clarified, which become manifest in health and disease, their domain of applicability can securely be assessed. The structure of physiological data, in which the health of an organism can be described, does not contain the way it maintains its health, but only the tangible result of its doings, and health allows and even implies ongoing development. On the other hand, disease cannot securely be grasped by determining the elements that many believe to be causal (influences such as viruses, bacteria, ameba, poisons, etc.), because individuals do not all react in exactly the same way. Additional aspects must be taken into consideration.

In these questions too the view is determined by the categorial foundation, i.e., the basic ideas in which health and disease are being mirrored. Contemporary natural science has chosen the basic idea of mechanism and is trying to formulate the principle of organism in terms of structured mechanisms. This is the course of action in modern biology, based on the 'New Synthesis' of Darwinian and Mendelian lines of thought. Here too the investigations were led into ever smaller details—microbiology, in its widest sense—without noticing that the path is imposed by the categorial choice (this mental mechanism has been explained ealier). For discussing the implied crux, here we will consider especially an example in medicine, namely Paul Thagard's widely acclaimed book How Scientists Explain Disease [1999].

An analogy of the human organism and the organism of reality as a whole is of course very problematic to the contemporanean mind, because there is a priori no evidence for this link, but at best some vague or even mystical old sayings such as "as above, so below," which can indeed seduce into fantastic misconceptions when formulated out of inadequate basic ideas. Yet on the other hand there is no proof for the irrelevance or even absence of this link. While a person can be held accountable for sensing its limbs and hence being able to equilibrate herself towards health, in nature or natural systems there is no tangible person. But here too we are confronted with the question of how, or more precisely through what ideational mirrors, the subject matter of

regulation is being approached and thought. It is evident that the choice of 'mechanism' as the guiding idea can only yield perspectives and problem solutions in terms of mechanisms. The question is how adequate is this approach? On the meta-level there is the question of how adequacy can be ascertained. Can for example a technique for suppressing the symptoms of disease be called a successful means for healing? There is a question of frames of reference, on which not everybody agrees. For some, getting rid of symptoms is health, while others consider side-effects, relapses, the gained personal strength in overcoming on their own the disease's nature, etc. Hence part of the problem is that also the practical results are being judged—as much by doctors as by patients—through an ideational mirror. If it is the same as the one that led into the situation, the 'blind spot' remains and erroneous aspects can't become perceptible—in spite of all empirical evidence—until a situation becomes grotesque, maybe revealing the crux even to an untrained eye. One can think for instance of a disease that is held to be normal in one society, while in some other one it appears as a result of bad habits or mad ideas. For a secure assessment one can't escape the need for grasping the problem as a whole.

In humans, health regulation occurs partly in ways that are given by nature—for instance in digestion or respiration—and partly through sensing one's own organism, which implies the mind. The mind must find its bearings in its own organic body, but this is not one-way traffic: in doing so it develops conceptually its capacity of dealing with its body. It is thus reasonable to view the organism as the wholeness of body and mind in a dialectical process.

Hence organic regulation does not necessarily imply a mind, while any mind must produce its adequate conceptual means, for which its body is the teacher. The question finally is in what terms one approaches the issue. Even on the theoretical level there are indications for a complete interrelation ('organic interconnectedness') already in the realm of inert matter itself; we might remember the immediacy of action-reaction, and the fact of quantum nonlocality. In the alive Body ('Leib,' body and mind), the gist of being organic is in its structure of conscious "double sensations" (Husserl [1952]), which no kind of mechanism can replace or reproduce: sensing for example the left hand by touching it with the right hand is impossible without the left hand sensing simultaneously also the right hand. The point here is that organic bodies are not built along intensive quantities (such as charge, pressure, temperature, or volume)—which today's science chose for depicting nature—but along hierarchies of equilibria. Since the organic body operates in self-referentiality, it can create its instrumentation in a free

way—conceptually not in rigid object-oriented fixations ('names and predicates,' language of manipulability), but in 'pincer'-type structures; manifestations of this "double sensation" type range from the symmetry of the prehensile hands to the necessary conceptual polarization in complete forms of conceptualizing. The brief digression here is to indicate that appropriate conceptual conditions—namely a reference to universal forms of order, which lead to universally applicable concepts—allow to recognize in a unified way the intrinsic interrelatedness of all material structures, from the inert ones—which are determined by external conditions (whether by 'chance' or by 'necessity')—to the organic ones, which can impose change to their own structure as well as to outside conditions. Grasping the nature of polarity and duality allows to understand how structural symmetries in organisms relate to conceptual polarities, and are not mere coincidence.

In contrast, Thagard [1999] follows contemporary science in holding repeatedly that—as opposed to mathematics and physics—there are no universal laws that account for the causes of disease; he deduces that the corresponding reasoning can thus on principle not be deductive. Even though this opinion is relatively common, it is true only within the self-limited view of today's mainstream, which does not permit to know whether a methodology might be found that reveals the desired universal laws. Believing today's habitual way of theorizing is the only possible one, not doubting the foundation of today's mainstream, makes absolute today's self-limitation in a self-contradictory way: the belief suggests knowing everything relevant (which is thus generally valid, some sort of universal law), simultaneously negating it in what is being expressed. This is a case of self-deception (believing one's belief to be more justified than it is). It would thus be more correct to say: 'within the horizon of todays generally accepted beliefs there are no universal laws,' for doubting the beliefs and remaining open for a better approach.

The problem has two essential elements: (a) what one believes to be a law, particularly a universal law, and (b) what one believes causation to be. In both questions, the context of health and disease is particularly interesting, because the consideration must finally cover totality in a strict way for offering certainty. One can of course acquiesce with less, but at a corresponding cost in understanding. Whether a view becomes majoritarian or minoritarian is another question, while the ultimately fruitful ideas never come from the majority.

In his careful analysis of today's scientific approaches to disease, Thagard considers science (descriptively) as what scientists are actually doing—not (normatively) as what ought to be done for making sure the problems are adequately being dealt with. In his considerations, the latter aspect enters the stage only in a secondary way, not on the level of the first principles. Of course descriptive accounts of science can inform normative conclusions (said explicitly in [1999:94]), but when the certainty of potential knowledge is at stake, the relativity implied by this procedure should not be tolerated. Thagard's stance is a bit astonishing, since after all he professes philosophy of science. But it corresponds to contemporanean habits, exemplifying a naturalization in thinking which shaped today's majoritarian view—as much in philosophy as in science—in spite of incurred drawbacks, outlined above. Thagard, seeking to explain as much scientific work as one of its fields: disease, trusts his choice in saying "This book is about the causes of disease and the causes of science" [1999:preface]. In understanding science he seeks to bridge a gap between the 'traditional' view, perceiving science primarily as a matter of logic, and the 'postmodern' view, perceiving science primarily as a matter of politics. As a solution he proposes his "integrated cognitive-social explanation schema" ([1999:8]). In understanding disease Thagard follows the path of causal structure in historically relevant disease concepts. A point to note here is that today's usual interpretation of the Hippocratic humoral theory, accepted also by Thagard, does not correspond fully to the way things were seen in classical antiquity. The four fundamental elements (earth, water, air, fire) were not meant as materially palpable forms, but as the type of order which organizes matter in a certain way; in the same vein, the four humors (blood, phlegm, yellow bile, and black bile) did not just mean material fluids, but types of order that permeate in a 'fluid' way the organism in maintaining its functionality—so of course any disequilibration of this order of four sub-orders was causal (corresponding to the modern aspect of psychosomatic causation). This does not contradict the severe lack of empirical detail that lasted for centuries, limiting the language for conceptual considerations (we will come to this point later). Neglecting the conceptual detail, Thagard espouses the object-oriented materialist path, which started with the germ theory of infection, as initiated by Louis Pasteur, and had to be complemented—because of the actual complexity in disease causation—with aspects of nutrition, autoimmunity, genetics, and environmental influence, leading to 'multifactorial' views of disease [1999:20-36, 148-163].

As much for explaining scientific work as disease causation, Thagard sets out on the idea that the whole complex of 'exterior' and 'interior' factors must be addressed [1999:5f and many indications later]. This is certainly the only reasonable way of approaching the problem. But on the systematic level he does not

address on principle the difference between conceptual problems (debating empirical phenomena in a structure of terms) and categorial problems (fundamental distinctions that determine what structure of terms can evolve), even though he had worked extensively on conceptual revolutions—to the point of making these two words into the title of one of his important books (Thagard [1992]). Although he certainly is aware of the systematic relevance of the categorial aspect, it seems he does not yet see how it can be made fully transparent (which is an aim of 'systematic attentiveness'). As a result, also with Thagard the crucial problems can't be approached uncompromisingly. For example causation remains under the spell of mechanism as an explanatory principle [1999:106ff], even though—as has been exposed—for disease as much as for scientific activity, the ultimate root of causes reaches deep into the part of the personality that can't be reached by mechanisms. It is true that contemporanean science is still operating on the conceptual foundation of mechanism, but Thagard's topic would merit more critique of this approach. In scientific work, the relative success of vigorous interrelation among scientists [1999:70ff] cannot make up for the absolute gap produced by thinking only in terms of mechanism. For finding a thoroughly secure answer to the question "what causes scientific change?" [1999:94ff], Thagard's "integrated cognitive-social explanation schema" cannot suffice, because it considers science only as a social process that is determined by sets of beliefs. The 'conceptual unification' he offers does not cover the crucial categorial level. Thagard considers only very marginally the possibility of abandoning altogether the principle of belief, in the skeptic attitudes that some scientists manifest, but he does not develop a consistent method for doing science without any belief—while relying on belief is the reason for wild meanders in forms of understanding, as history reveals. Yet most scientists are very vexed when confronted with the fact that their activity is ultimately based on mere belief (for instance in the certainty offered by the principle of measuring, of which they forget the 'blind spot'). They usually defer such questions, for example by attacking the questioner as a member of the 'other side' in the 'science wars' (opposing natural science and the humanities, the 'two cultures' according to C.P. Snow). But this opposition does not solve the problem—if only because both sides still prop up their systems on fundamental beliefs, albeit of a very different sort. This is why none of the two sides can win (e.g., Brown [2001]). In this struggle, a sustainable clarification and durable peace will be found only once a robust methodology is adopted that can deal uncompromisingly with the acquisition of knowledge, without any basic belief whatsoever. It is true that today's mainstream can't offer this type of methodology (above we have seen why)—but this situation is not "the end of history".

Under the presently usual cognitive and theoretical conditions, there is thus a certain risk in trusting the offered type of explanations, as much of science as a type of endeavor as of the causes of disease as a type of organic disorder. It is interesting for example that in Thagard's account the difference between curing and healing does not appear in a clear way. Given the presently habitual path of reasoning, this is no coincidence, but practically inevitable. Within its framework it is extremely difficult to know whether the explanandum is causally effective or only a necessary condition. In old times doctors knew that medicus curat, natura sanat (the doctor administers a cure, but it is nature that heals), acknowledging that human intervention can only influence conditions, but not impose a healing process as such. This distinction is not part of medical knowledge any more. We have entered an era of a purely technocratic type of science: it is oriented towards manipulating symptoms, affording no mentions that healing is a process in which the stricken organism can learn something about itself, especially about its needs and mental techniques of equilibration. Insofar as the distinction between curing and healing is abandoned, while medication is being administered as some sort of magic bullet, the difference between medicine and magic, or implicit coercion, is eroded. Behind the impressive display of ever more refined technological instrumentation, there is a relapse into old patterns of mind. As much the understanding of human ways of being as the self-understanding of the patient is at stake, including widespread misunderstandings of death and dying.

This aspect leads us to the 'inner front' of human beings, their self-understanding, and as a result their psychic status. By being implemented in practice, the doubtful theoretical basis of today's mainstream produces myriads of microconflicts, of practically imperceptible clashes between the nature of things in their own right and the scientifically (and therefore 'officially') justified human interventions. These conflicts are accumulated and amount to something like an invisible wall that nevertheless determines the course of the individual. This is not to say that ancient times were always better, but that the massiveness of belief in today's habitual approach is an obstacle on the path towards sustainability. The provoked crises are necessary not in an absolute way, but for waking up to reality in a more complete sense. We mentioned earlier a specific form of coercion that is organized in an imperceptible way, arising from a specific way of handling property. But there are many other such forms of coercion; in sociology, especially Pierre Bourdieu coined the term of 'structural violence.' These implicit coercions have an insidiously intimidating effect.

Sensitive and helpless individuals often have no other choice but to develop a mental disorder; a widespread form of it is depression. The spreading of substances such as Prozac is no coincidence. The phenomenon is relevant not only psychologically, but shows increasingly also a sociological dimension. Subjecting reactive children to a coercive regime (for instance by means of Ritalin) is not a sign of coming to grips with the real problem, as it does not stem from a deep understanding of life in its own right. Imagining life can arbitrarily be manipulated is an endangering belief. It neglects the distinction between causes (activity in its widest sense) and conditions (materiality in its widest sense), obscures the difference between curing and healing, and makes autonomy into a huge problem.

As a result, the approach to psychic disorder evolved in strange ways. While the founding fathers of psychology—for instance Sigmund Freud—sought to heal people by helping them to solve their problem, addressing it on the psychic level in intelligibility, mainstream thinking increasingly acqiesced with possibilities of manipulating the symptoms, up to making them vanish as by magic. Thanks to neuroscience and biochemistry, pharmacological substances are now extremely effective in doing so. Administering these drugs allows the patient to meet the usual social duties to a certain point. The trouble is that the actual problem is not being solved in this way, but only deferred—in fact it very often becomes chronic and the patient becomes psychologically dependent on the medication. In the end it is not clear any more whether such substances are a medicine or a drug, since this type of medicine is breeding an addiction. One cannot truthfully talk about healing such psychic disorders: the symptoms are only faded out of consciousness by the cure. The public is rarely being informed about this side of the facts, because many articles in the media are sponsored by the pharmaceutical industry (for example Alain Ehrenberg [1998] gives a detailed account of the historical process, including a wealth of pharmacological details). Given the overall structure of the problem, and the scant understanding of personal identity that the mainstream in modern philosophy and science allows, it is easy to predict that the 'inner front' will become a major spanner in social interaction probably relatively soon. A population kept biochemically in self-alienation—since the root cause of psychic disequilibration remains unsolved, only symptoms are being eliminated –, will not be able to solve adequately the fundamental questions of existence. The probability of irrational reactions, from exaggerated religiosity up to running amok, is actively being increased rather than decreased. Escaping the created loop requires understanding human nature in a complete way—which becomes possible only by overcoming the categorial self-limitation of today's mainstream: assumption-based (and hence finally formal-mechanical) ways of thinking.

The bottom line of our analysis is: at the very end of any of its threads today's mainstream can not distinguish knowledge from mere belief—indeed, it defines knowledge as 'justified true belief.' This situation is not improved decisively by introducing additional formal criteria of corroboration. The available explanations too often are mere descriptions—allowing a partial understanding through detailed imagery, but not reaching full conceptual clarity on the level of intelligibility.—This critique is not meant as an accusation, it only aims at revealing the point where mental mechanisms are still allowed to operate where a truly organic endeavor would be appropriate. Such critiques often express a moralizing appeal—which is not helpful. The only reasonable means for improvement is insight into the phenomena and their interconnections, seeking the level of pure intelligibility. The considerations up to here show that the presently majoritarian belief structure is (a) not compelling, and (b) not fully up to the task; they should thus allow its origin and nature to become more clear than usual. As a result, the reader might have developed a hunch that, in spite of widespread fears, a viable methodological alternative should exist that allows a unified knowledge-based society for sustainability to arise.

So much for the diagnosis. But what can a sound therapy actually look like?

Solving the Problem on Principle

The principle of the new proposal is simple, but implementing it is rather demanding. The point is that an uncompromised scientific procedure, capable of coping with unity and hence strict totality, can be warranted only by leaving away all fundamental assumptions—or, in the mentioned jargon, 'listening' to the overall interconnection of content instead of 'talking' into it prematurely. All worthwhile philosophy proposes this gesture for its beginning: Socrates and Descartes in systematic doubt, Kant in suspending judgment, Husserl in epoché, Arendt in 'new life,' etc. In fact, at the root of all real progress one always finds this basic attitude. But it seems awfully difficult to perform and to sustain, even though in principle it is easy to stop talking into the problem before it can unfold. The act of stopping one's 'mental radio station,' for being attentive to an object or idea, is always a possible choice, even if not all conditions allow to materialize it. While no belief is necessary, beliefs can be accepted under pressure, adapting to given

conditions—for instance canonical prejudices in a scientific paradigm, or the way of life in an ideologically tinted social environment. For example our Western civilization succeeded in installing a type of everyday life that continuously distracts from a chosen topic. A systematic understanding of how sustained attention can be achieved is then helpful.

A sound systematic basis can thus be found by following closely the process of querying. We can approach things only in a perspective, out of a specific interest. Actively sustaining a query has a purifying effect. The deeper we reach, the better we can grasp the complementing/polar background of what we saw at first. Studying the genesis of concepts shows that any conceptual aspect A can in the very end be thought only on the 'mental background' of non-A, the content that is strictly polar to A. This fact gave rise to many streams of thought under the title of dialectics, because knowing A makes aware of its intrinsic conceptual dependency on non-A; hence becoming aware of non-A leads to realizing what A really means. Then A and non-A together cover totally the universe, under one aspect: the queried one (in this example: A). Hegel unceasingly draws from this well, and it allows to draw a conclusion for systematic attentiveness: upon completely exhausting a query perspective conceptually, its perspectivity and universality become fully compatible.

The other side of the coin is that any query leads in the very end to a polarized conceptual space, as required for really understanding the query's content. The more intellectual efforts are fathomed, the more examples abound, showing why sustained attentiveness to the subject matter is crucial. For instance Aristotle, querying the nature of change, eventually found 'form' vs. 'matter'; Kant querying cognition finally found 'perception' vs. 'thinking'; or Saussure, scrutinizing the primal nature of the sign, reached 'the signifying' vs. 'the signified'; etc..

It is of course not evident that such polar structures do not merely stem from logocentric mental habits, but reflect a real law of nature. The most compelling evidence for the second case is available in a branch of mathematics called 'synthetic projective geometry', of which a glimpse was given earlier through the example of the triangle. It is interesting especially since Hilbert's program of axiomatization proved not to be realizable that synthetic projective geometry is finally the 'mother' of all geometries, including the now famous non-Euclidian ones, and that it has been most fruitful where it was approached non-axiomatically, as by thinkers from Christian von Staudt and Felix Klein to Henderson [1998], thus avoiding the self-limitations of traditional formalization. The path was to develop the elements (point, line, plane) intuitively instead, with linearity as the only invariant and infinity not as a

special case, as in Euclidian geometry, but being strictly thought through at every step of developing further the geometric structures. Formal approaches to projective geometry are of course possible and in fact are the most prominent ones in actual application, for instance in physics, but the front of heuristic insight has remained in the synthetic branch.

Nevertheless, a conceptual polarity, discovered upon fully having queried a content, does as such not yet disclose all the implications of that content. For example in Aristotle's query, 'form' and 'matter' do not disclose totally what is actually operative in the 'form' aspect and what the precise qualities are of the 'matter' aspect. But we already know the instrumentation for an extended interest: to follow up the queried content to its very end. Indeed, asking about the nature of the two 'ends' of a polarized content is of just the same type as asking about the nature of that content itself. Hence we can apply the acquired polar concepts upon themselves. (for details about the systematic development of the concepts, see Schaerer [2002], [2003a]). The result is always a set of four conjugated categorial concepts, a consequence of the query's content. Every query content defines its corresponding four categories. As an example we take Aristotle's query of change, querying first 'form' (the agency), then 'matter' (the respective 'mirror' or 'conceptual background', indispensable for understanding).—A graphic illustration of the systematic structure might be helpful (fig. 2).

In this example we consider the perspective of querying processuality, particularly useful for natural science and its approach to 'things', which should be understood in their intrinsic dynamics, because no material thing is eternal. Today's mainstream attempts this too, but is limited by its own assumptions; even 'energy' and 'information' are not suitable notions for a strictly universal solution, because neither is a really fundamental concept. Energy cannot be primal, because it is force organized in spatio-temporal dimensions (the agency is conflated with the medium in which it operates, space and time); the primal term is force, not energy. Information can't be a primal term either, since its definition—whether with Shannon (signal theory) or Boltzmann (structure theory)—excludes the information required for distinguishing between meaning and mere noise; the relevant term here is pure order. Relying on 'energy' and 'information' as a conceptual basis sets the stage for a long period of deferring crucial points into 'new' ideas and research areas—but we should be cautious, because not all the resulting fragmentation is progress: as we saw, basic errors 'evolve' into ever more words, languages....

Systematic attentiveness encompasses, in the result of its processual query, all types of structural change in

Figure 2. The structure of self-equilibrated conceptual tetrads.
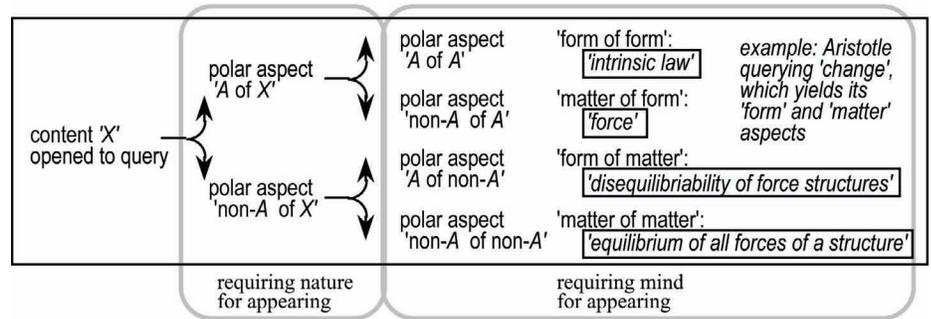
anything that appears as a processual unit, from particles in physics to beings, populations, ecosystems, economies, propositions, and mathematical equations. The specific qualities of the developed categoriality stem from being developed coherently—in full self-referentiality—out of one content; it embodies thus itself the essential characteristic of that content. In the example of processuality, its sheer dynamism permeates the four categories themselves. The two equilibrium conditions (disequilibriability and foundational equilibrium) are therefore to be understood in a dynamic sense: every 'thing' is constituted by equilibrating its intrinsic flux: energy (particle, substance), water (waterfall), material/mental metabolism (alive being, group, population, ecosystem, city, nation), value (economy), conceptual content (metaphor, proposition, mathematical equation), etc.

The difference between being inert and alive requires additional criteria for the structure: heteronomy vs. autonomy, which can be partial (having organs regulating sub-equilibria, which one does not control oneself). The existential laws of the inert are a subset of the laws of life: also matter arises and disappears, and should finally be understood in its complete cycle.

The perspective of processuality is useful for approaching directly the problem of life and death. No living being ever fears the law of death, because this law is an integral part of its life cycle. But all living beings fear the materialized process of dying as soon as it is inflicted by others. Our two equilibration formulations are exactly the categories needed for distinguishing dying out of self-fulfillment from dying out of external influence (in cell biology: apoptosis vs. necrosis; today's biology can't explain why two types of death exist). The idea of equilibrium is useful also for explaining the role of sleep (the 'little brother of death'), which can be noticed in empirical approaches, but not fully explained as the need for regeneration through higher forms of dynamic equilibrium than what is produced by everyday activity. The basis of sleep is in the foundational equilibrium of material matter, as it corresponds to what is called 'death' in biology (Schaerer [2002]). Alertness of mind

in this basic point transmutes 'death' into 'life'—yet this awareness must be willed. Material matter is the ultimate master, but in its own way.

Problems of hierarchy 'within' live units, for instance in humans with body-independent thoughts, stop arising when acknowledging these as part of the constitutive flux: humans are not only their body—and can be understood in all aspects. Nothing is beyond this grasp, and immateriality needs no mysterious connotations, since the categories disclose the structural identity of material and immaterial processes, in inert just as in alive entities: while structures in the material realm are the result of actual equilibrations, correct propositions and equations express conceptually the conditions of the equilibria. In the debate, three forms of truth should be distinguished: (a) truth on the level of overall order (intrinsic law), as the mirroring 'zero-force' equilibrium between the two involved sides (depending on the chosen query perspective: percept and concept, subject and object, signifier and signified, mind and material fact, etc.); this form of truth is often referred to as a 'regulative idea'; and (b) truth on the level of appearances as (b1) truth theories, whose form is determined by the aspects they emphasize, and finally (b2) the adequate mental impression and then linguistic expression of a specific fact, which appears in the truth-values of propositions. Error, self-deception, and lying, result from holding specific types of belief.

Questions remain concerning an 'inner sense' that must exist, as thinkers have an awareness of what they think. Logic could not make sense without this sense organ. The materiality of a sense organ is another point; understanding existential structures as law-cum-force complexes offers a new key, also example to the 'mind-body-problem' and its prolongations into the (un)-freedom of will. Since both the categorial setup of a mind and material matter are conceivable as law-cum-force structures, albeit not produced in the same way, self-movement is possible to the degree of mastering one's intrinsic material structure (organism, body and mind). This is achieved in infant life, internalizing interactions in a long process of automatizing gestures by relating mentally to material conditions, until developing

deliberation. In interactions between laws-cum-forces, force on the mental level (will, choosing motives) and on the physical level (moving one's own and other matter, following chosen motives) does not operate under the same condition. The material condition of the mind, deliberating its actions, is the categoriality it adopted (by having invested will in basic decisions, specific forms of order); this structure determines its limit. In physical action, the material condition is imposed first by the body, whose structure the mind can't determine, and then by all other material conditions of the universe. In the free will debate, freedom of thought and of action are thus being differentiated (Kane [1998] offers an overview). A Laplacian demon is an inadequate frame for determinism, because it hinders the clarification of the conceptually bridging element between matter and mind. Mastering one's bodily condition—the root of correctly understanding materiality—can't be achieved by means of abstract 'information' and exterior manipulation, it is a concrete conceptualization that must personally be worked through; the person is totally involved at the crossroads of her subjective motivational choices and objective material conditions—as any infant shows in its exploratory process, or later any psychotherapy.

Traditional approaches make it particularly difficult to fathom whether immaterial beings can exist or not. The solution is in realizing that any being can become independent of material matter by achieving full self-regulation in the dynamic equilibrium of its mental law-cum-force elements. Shaping one's categoriality in this direction—liberating oneself from compulsions—is best possible while incarnated, because only this condition allows to act autonomously and test the effect. Spirits don't inhabit the necessary materiality: an individual material body. The ultimate activity is 'listening' to the activity itself of 'listening'—actively, directly enacting self-referentiality. It is no coincidence that this threshold is essential in all religions. In systematic attentiveness, Science, Art, and Religion cease to look antagonistic, revealing parallels instead.

While 'hard' sciences learned to manipulate objects of the material world, 'soft' sciences manipulated the possible presuppositions, producing all sorts of paradigms, also for the 'hard' sciences. They produce techniques of manipulation, but when manipulation is left to its own devices, sooner or later it manifests a one-eyedness: it is blind to its own foundational doings. A one-eyed vision can only be cured by developing self-awareness. Whether a civilization has learned to manipulate 10, or 10,000, or 10^{1000} objects, is irrelevant compared with whether it has seen through the idea of manipulating its own mind by believing in favored assumptions. Being able to handle ideas like things has been a very seductive idea—up to

becoming a myth whereby control and domination is universally possible. But corresponding losses in the long run remind of unsolved problems. Assumptions may seem plausible at first, but in the course of interacting with reality they require to correct the theoretical structure, working off the assumption's effects, which shape thus the respective philosophy or method.

In systematic attentiveness there is no need to assume anything. Instead one first clarifies one's will—i.e., what one really wants to know, finding the appropriate perspective—unifying thus on principle the point of departure. Two paths are possible: one can choose a query perspective that has already been developed, providing the corresponding fundamental polar concepts (such as 'form vs. matter', 'perception vs. thinking,' 'the signified vs. the signifier,' etc.), or one can develop oneself the content of a query perspective (which takes a long time, however, for getting to the categorial bottom—in the mentioned examples, this process took Aristotle, Kant, or Saussere some decades). Our proposal is to prolong the polarizing process, applying the relevant one to itself, for discovering the rest of the implied content. This path does not face the limit of assumption-based systems, because the query content can unravel completely according to its own nature. The given topic is taken as it is, applying no arbitrary primal distinction, not even 'subject' vs. 'object.' The produced categorial structure then is on the level of origins (arché), yielding the ratio cognoscendi in the epistemic perspective and the ratio essendi in the ontic perspective. In the result, conceptual unity and differentiation can be equilibrated in a precise way. This is the condition for systems to be adequate to wholenesses.

Whoever is accustomed to thinking in a traditional frame of reference will have an aversion against the ideas of universality and certainty. This is justified in such a framework, because it does indeed not allow much of the sort. But that's not exactly the ideal solution. For breaking loose, it is helpful to realize that the mentioned examples—'form vs. matter,' 'perception vs. thinking,' 'the signified vs. the signifier'—are well-known concepts that are strictly universally applicable (i.e., not only to objects in the traditional sense, but also to the act of thinking about them) within the respective query perspectivity. This is clearly a form of universality, and it is not at all impeded by using these concepts in a self-referential way. Systematic attentiveness merely generalizes the polarization pattern, introducing no anthropocentrism of any sort.

The question of certainty is situated on another level. It is pretty obvious that no amount of observation of something can ever exhaust the possible predication. Insofar there seems to be an absolute limit to the

certainty of any grasp. But the developed categorial tetrads don't offer any direct predicates (e.g., 'this thing is red'); instead, they are heuristically relevant (e.g., 'check on the color': useful for guiding the observation, phenomenology, etc.). This is clearly a form of certainty, albeit of an unexpected sort. The respective phenomenological assessment or hermeneutic investigation still needs to be achieved of course, but its categorial guidance is secure. Phenomenology and hermeneutics also propose to open up to the subject matter, i.e., to 'listen' to it instead of 'talking' into it—which can be understood by anybody in any culture and is thus a trans-disciplinary basis—but they cannot achieve immanently a clarification of their own categoriality. The widespread complaint, whereby knowledge can never be totally secure, addresses only gaps in what is observable or can be handled as data. But in systematic attentiveness, instead of talking about such tangible aspects only (attributes and predicates, the language of manipulability), one talks about the qualities which are relevant in an overall structural way (addressing order as such, operating in the language of intelligibility). Attempts to grasp the 'essence' of things are doomed to failure when hoping to reach the goal by predicating attributes—because these are always contingent (i.e., not ultimately compelling, but determined by chance), since doing so depends on the chosen but not clarified perspective. In contrast, the approach we propose fosters an uncompromised quality by proposing to clarify the nature of perspectivity itself, revealing the law of nature that governs it (polar conceptualization upon fulfillment of content), and proceeding from there. By setting out integrally, the cognizing subject can operate integrally.—But how does this look in actual practice?

Considering the Mind Itself

For approaching whatever, it is useful to make sure first about how to use the instrument: our own mind. Some of this could already be read above between the lines, but now we can make use of the limitlessness of the proposed approach for considering the activity itself of querying and understanding, also in how habitual science goes about this topic. The resulting new clarity liberates the mind on the one hand for an uncompromised self-understanding, and on the other hand for applying the new approach also in the other scientific domains.

The mind is produced by nature without providing a user manual. The social context has its effects in conditioning new life gushing forth that learns how to use its mind by encountering malleability and resistance in the social structure. Much can be shaped by this context, but not strictly everything. We all build up our system

of categories and representations by experiencing our alive bodily organization that is constituted by the same 'language' as the whole rest of the universe. The judging instance is always the same: the 'I,' whether conceiving emotions or what body senses present. Insofar the now widespread question 'how does the world get into our head?,' based on the idea of some 'reality independent of our consciousness,' displays essentially an estrangement from our own potential of integral conceptualization. It splits up artificially the continuum of openness and interjects abstractly a sensory system, which is in full reality precisely a bridge to otherness, not the imagined abyss. The fantasy in alienation is that our skin is the limit for understanding physical reality—as if all our own body and its sensory system, including the brain for mental sensitivity, were not understandable in exactly the same way as all other appearances. Of course in 'summer' of the 'four seasons of being' our body is more closely linked to us than other material objects, because we have to learn how to move it non-conflictually. The real question therefore is whether we aim at totality and get our foundational concepts right, or in other words our categoriality. Only this path can teach us for instance why human beings have no body senses for electricity and radioactivity: wherever the corresponding phenomena happen to arise, they are equilibrated by nature towards zero (overall electron-proton-ratio, radioactive decay, etc.). If humans decide to accumulate matter in a way that produces such phenomena, they are responsible themselves. There is no point in feeling superior to nature because it has allegedly forgotten something.

A problem might arise for some by talking about the 'I,' since it is not a palpable object of the material world. We mentioned that the finally relevant elements for intelligibility (e.g., laws and forces) are never directly observable. It is therefore naive to expect the 'I'—the locus of intelligibility becoming relevant—to be a palpable entity. In this question too the distinction between (a) an order as such and (b) its manifestation in other forms of order is useful. Taking complete self-referentiality as the type of order that can be called the 'self,' and manifestations of this order as what can be called the 'ego,' solves the problems that object-oriented methods produce for themselves. This conceptualization of the self corresponds to what was sought in the 'essence' of being human. Critics of an essentialist perspective should not forget that their limit in understanding this perspective does not mean that the perspective is obsolete. And critics of the self as principle of complete self-referentiality might remember the scrupulous investigation of Søren Kierkegaard [1983]. Prolonging his philosophical considerations—of which his theological interpretation is not compulsory, as he writes himself—reveals that the type

of relation called the 'self' is not its manifestations, in fact it can't manifest itself on its own. It is essentially the type of organization that distinguishes human structures from other ones. The necessary 'force' aspect resides in the 'individual desire,' manifest in an individuality (appearance in time: what evolves self-fulfillment of a person) and its personality (appearance in space: what can be perceived of a person). Without desire there is no manifestation of the self; the 'ego' is the totality of personal manifestations. In our new approach, the important difference between values and ideals as sources of motives also becomes more transparently intelligible than in traditional systems, where they are usually mixed up. Values (e.g., virtues, but also power, ownership) draw from the well of collective attractivity, while ideals (e.g., beauty, freedom, friendship, harmony, love, peace, truth, understanding) stand out by relating to conceptual totality in a non-coercive way, and need not represent a collectively attractive idea. The difference in animals and plants is that their fundamental desire and hence agency is located on a collective level, i.e., the specimen cannot autonomously reflect ideals and manifest independent individuality. The validity of values and ideals can become rationally debatable in a universal conceptual framework—as opposed to the usual ones, which are indeed limited.

In any approach looking 'from outside,' the mental act must remain mysterious because it occurs in the crossover point of 'cause' and 'condition.' Categorially speaking, agency is polar to its result, the product of agency. A direct way of becoming aware of this is in considering our own mental act. To feel something or think of something does not occur 'out there,' since we are doing it (in the 'I'-mode), engrossed in the specific content we deal with ('consciousness of something'). We can't notice this fact during the mental act because we are occupied with just this content. From a propositional point of view, this fact must logically lead to a belief that this duality is inevitable: either think content or think the idea of thinking content. This is correct insofar as the average person is indeed not aware of something and simultaneously of thinking it. Looking only 'from outside', an abyss—moreover one polarized into the categories of subject and object—seems to separate pure object and pure act. But sensed 'from inside' we are all perfectly coherent (even if seldom aware of our own coherence, since we don't focus our attention on it), and we can develop our awareness beyond the usual one into new areas, precisely because we are ourselves all of the mental field. We can focus anew and don't only have results, offering what a propositional point of view works with, and what any formal logic requires. One may fantasize that qualia (profoundly individual experiences) are mere illusions, but if the individual thinker saying so had no clear idea of what he is thinking about, he or she would not be able to theorize correctly. The key to understanding the 'innermost' is in noticing that any clear thought always shows all of its content, there is never a hidden part of an idea—in contrast to materialized life, where everything is limited to some perspectivity. On the other hand, clarity is not given for free: without our directed attention it can't securely become manifest. Without using our will we remain in associations, fantasies, suppositions, whims, a wandering mind, etc.; some people never go beyond. The universe features freedom, which includes in other words: no material compulsion to develop one's mind.

In systematic attentiveness, there is thus no mystery between order and agency in the 'I': they converge in the 'I,' or rather in 'I-ness' (the self, not the ego on its own). We all know this through the fact that one can understand totally only oneself what one is doing in one's own mind (in philosophy this is the 'other mind problem'), while doing so is always an activity, in which one can be interested by participating in one's own intentionality instead of letting one's mind drift off on its own. The self constitutes an overall order that allows simultaneously full differentiation and full unification. For the individual person herself this is not too mysterious, but when thinking of the universe in its overall order, where there is also immediacy, most natural scientists will feel uneasy at the thought that there might be an 'I-ness' within it. Note that we do not need any hypothesis of God in systematic attentiveness, but that this approach is compatible with it: there is no contradiction. Note also that 'I-ness', or God (or whatever other name it may be given), does not mean that this instance has manufactured the beings like people manufacturing gadgets in a factory. This is a relevant point for the debate between proponents of Darwinian evolution, 'intelligent design,' and creationism, in which all sides are caught up in ultimate inconsistencies; as things are, none can win. Once one gets used to 'listening' to one's own activity itself of 'listening,' the whole setup can reveal itself as being conceived in a much more intelligent way that any of our factories can ever be. It embodies the art of perfecting continuously the overall order, which can be grasped only in pure intelligibility. Not the material product (the evolving beings) is the result, but the overall framework within which the beings unravel their evolution; they are simultaneously totally free (in choosing their perspectivity) and yet perfectly embraced (in the ultimate consequences of their choices). A noteworthy point (especially for undogmatic feminists) is that in alive 'I-ness' the traditionally 'feminine' aspect of being, sensitivity ('listening') and its 'masculine' aspect ('acting out') are united, structured according

to the content that is being dealt with. In terms of pure intelligibility, the overall order is of the character of 'I-ness' (or selfness), simultaneously all-encompassing and perfectly equilibrated in content. It allows all beings to manifest their own paths—they are free to choose even their own degeneration. Where hindrance arises, it does so only between beings—while the solution in conflicts can be found in considering the overall order, 'I-ness,' selfness, etc. (the name is less important that what is being meant by it).

Today's mainstream operates in a look 'from outside,' hoping it will warrant objectivity. The stance stems from a myth whereby the problem is true predication. The obsession is to find truth in propositions. It leaves no other choice but to shift crucial questions into forever smaller details, while no propositional system can ever be absolutely true. The real task is to care patiently about strict totality, 'listening' to all facts before predicating. Otherwise one is only the priest of a confessio, causing wars between paradigms, as Thomas Kuhn has shown. The principle of religio can't be fulfilled by seeking a 'co-evolving' relation with neighboring disciplines, or by making absolute one's favorite partial holism (e.g., epistemic holism, ontic holism, quantum holism, semantic holism, etc), of which none is completely holistic.

The danger of science on such paths is that it produces objectively unnecessary problems. The Necker cube and similar graphic arrays are a good example (fig. 3). We can either see a cube facing down to the right or one facing up to the left, but not both cubes at the same time. Is this an illusion, as we are 'scientifically' being told? And if it is one, will it be dissolved by seeking the ultimate neuronal correlate of consciousness, and detecting it—e.g., in the inferior temporal cortex? (For a fairly detailed presentation of the current debate, see MITECS: The MIT Encyclopedia of the Cognitive Sciences, online on http://cognet.mit.edu/MITECS).

We can notice that once we saw both cubes, we can decide which one to see, and switch at will. In this way we can experience what makes the real difference (since the percept as such is the same): the mental representation that we produce by our interpretation at will. Offhand we can coherently have only one representation at a time. Wanting to have both requires quite some effort: mere gazing at the lines won't yield the result, but people who are sufficiently trained mentally can remain even in the undecided state of mind. What they did is understand the facts, thereby creating mentally a representation which encompasses both in the mirroring equilibrium. The choice at will is crucial—and precisely what the cognitive sciences will never be able to find, because it is unthinkingly excluded from their categorial structure and can thus not appear in their query. Whoever seeks mechanisms can of course find only mechanisms.

Other 'illusions,' such as the Müller-Lyer lines of seemingly different length, or the vase vs. two profiles facing each other, can be disentangled in the same way, by conceiving the facts between perceiving and thinking as they ultimately really are. A seeming difference in length, or the choice between vase and facing profiles, is a result of interpretation: a conceptual act, but not of perception. The crux is our unawareness of automatized interpretations which we perform all the time. Usual science can't be helpful in this point, because it only measures the automatisms, it can't detect their erroneous conceptual basis. Higher precision in measuring will not lead further. The habit even in the most advanced forms of psycho-physiology is to not distinguish conceptually between the polar aspects of pure perception on the one hand, which appears in consciousness without the subject's contribution, and representational interpretation on the other hand, which appears in consciousness as something being modifiable at will within the scope of what is recognized and reasonable. The actual facts have to do with illusions only to the degree of remaining in some categorial confusion. The real problem is too narrow ideas of what categories and concepts are, and a widespread unawareness of one's own mental activity. There is an illusion in the belief (and as a result 'scientific' interpretation) that some perceptions are 'really' mere illusions. Science would do well to become completely scientific; it could do so by reflecting completely its categoriality.

Inadequately understood mental automatisms are the source of more problems. Take the example of the neurosciences, where measuring brain processes led to the notion of 'readiness potentials': the brain structures content which appears later in consciousness. Technically,
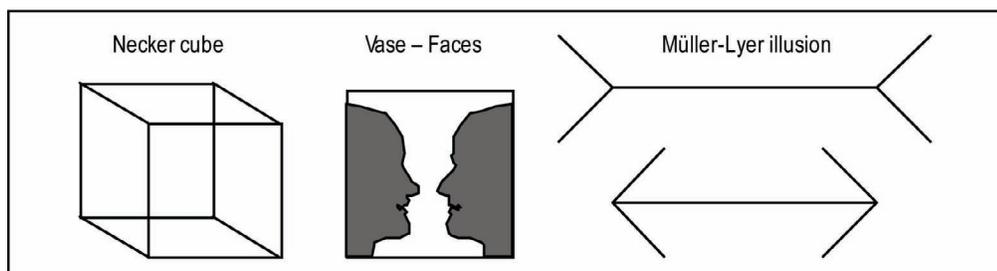

Figure 3. Optical illusions.

the measurements certainly are correct; there is no need to doubt that. But what structures are being measured? Where do they originate? Neuroscientists don't seem to observe attentively the infant's active exploration of material reality, in which it produces countless automatisms because it would be impossible for instance to move a limb or walk straight if one always were compelled to think of the many partial movements. The partial automatisms and their overall organization must be 'deposited' in some way in the organism (Michael Polanyi has called this 'tacit knowledge')—which does not mean the material traces are the causal ones. But it is no surprise that an intentional call to some order (content) then evokes the respective processes, which can be measured in the organ of sensitivity for pure order, the brain. For knowing this, no natural science is necessary. It is sufficient to realize that order (content) can be operative ('law-cum-force') without needing to take a propositional form. The possibility of translating pure order into conceptual and propositional form doesn't mean that nature itself is operating in that way. Precisely the infant proves this. Of course the whole setup can also be depicted through the categories of neuroscience, leading to a picture that is useful in some respects and will look convincing to those who believe in the scientific attitude. At the very end of that line there is nevertheless no full certainty, but a mere set of beliefs (basic 'scientific' assumptions).

I have chosen the example of neuroscience monitoring brain activity, and in parallel the geosciences monitoring nature's activity, for several reasons. One is that thinking is the domain we all can experience hands-on, discovering how different things look depending on the used conceptual spectacles. Another reason is that the two fields have more in common than what meets the eye. Whether seeking to secure sustainable forms of understanding and theorizing, or seeking to secure sustainability for life (or at least survival), one-eyedness is not a good option—while the mentioned intrinsic limit in content that ought to be mastered is not just an attribute of the neurosciences, but a general feature of the instruments for gaining knowledge which have been developed in the Western hemisphere. It may seem strange, but the cause of the limitation that is inherent in these instruments led also to their success in influencing the rest of the planet. Remember our two equilibrium conditions: disequilibriability and fundamental equilibrium. Brute power and domination always produces a first 'success' (because all structures are vulnerable, modifiable), but in the long run brute power and domination always is compelled to disintegrate, because it does not produce sustainable conditions. Once one really knows, there is thus no need to attack brute domination; it is sufficient to wait until the process ends itself. This is why there is

no Celestial Intervention when horrors are being perpetrated: no supreme being has any need to interfere when humans are stupid enough to aggravate their existence. On the contrary, the precise non-intervention of such beings is the only real guarantee for the cognitive process in unaware beings to unravel in a non-adulterated way (in a superior equilibrium). The framework of the universe is their playground until they learn what things are about. One point is in understanding the inverting quality of birth and death, and the important difference between living in self-fulfillment versus living in coercion. In scientific activity, the habits of dominance do not have the spectacular results of obvious horror, so they can go unnoticed until their effects accumulate. Wanting to base everything on empirical evidence compels the produced errors to appear on the empirical level too—which explains why man-made catastrophes do occur and constitute a systematic danger.

A good way out is to apply the proposed new approach onto one's own psycho-organic being. Try yourself, experience the effect of sustained mental 'pulling' instead of 'pushing'; 'aspiring to something' and 'being inspired' are quite appropriate expressions. Self-clarification is first physical (relax the body completely: attentively accompany all muscles to the 'zero-force' overall equilibrium), then psychic (let idiosyncrasies pass away, finding 'peace of mind': attentively accompany all thoughts to the silence of overall equilibrium), for then taking care of chosen content (allowing it—a question, a mathematical equation, etc.—to equilibrate itself according to itself: attentively accompany the complex of content until it is poised relaxed in itself). You can experience how sustaining your openness—akin to the active curiosity of a small child, but now made adult by willful choice—has the effect of concentrating your being towards its own 'inner roundness,' transforming even quite heterogeneous elements of the past into part of what you always wanted to be, but could not manage to integrate. At its best, this process unravels in a wordless but fully aware way. It allows the relativity of assumptions, beliefs etc. to be perceived; they are not instantly overcome (integrity requires complete 'inner digestion,' more than the first move), but at least they can surface in awareness. Depending on the person, her interests and degree of psychic (non)integrity, the mental discipline of sticking to a subject matter for its own sake may require particular care. Infants can sustain openness naturally when they are well-equilibrated, but cannot choose to do so at will, while adults often must learn the whole process anew. Nevertheless, the practice of mental 'pulling' instead of 'pushing' is the only fully honest way of living—and also of doing philosophy or science; real progress always draws from this well. I merely propose a new systematization.

Earlier, we touched upon the earliest approach to totality by seeking enlightenment for actualizing revelation as a source of knowledge. Now theoretically nearly everybody rejects revelation as a method or systematic foundation, but in actual practice even nowadays a high priest's attitude has not entirely disappeared among scientists, especially where they have led fragmentation into 'causative elements' to the point of these disappearing from the material level, making believe then the spiritual level is being addressed; understandably they sincerely believe in the foundational assumptions of their methodology. The opposite side is in seeking revelation by means of allegedly stopping to think—not realizing that this path builds up a conceptual barrier through extremely intense thinking, of which 'not thinking' is only an effect of the barrier collapsing. Adepts of the respective (often Oriental) techniques tend to cut out this fact. The abstractly willful, even arbitrary mental activity that led there is being faded out in clinging to a myth. The unity of the doer and his result requires no such procedure, and can sustainably be experienced by becoming aware of categoriality and intentionality. An activity of 'thinking not-thinking' is indeed not the same as 'willing non-will' in a sense of 'listening' in simple openness to reality; the closest version to this is in the Zen tradition, in which the categorial conditions are not fully clarified, however. A danger of experiencing purely mental light is to believe oneself to be an infallible authority, imagining this to be God's way of being. Having had such experiences makes it difficult to grasp their relativity. Apart from the basic difficulty of knowing what 'God' really means, it is useful to realize that structurally all beings are the same as the cosmos insofar as they all embody, by dint of their material organization as entities, the principle of self-equilibration, without which also the universe as a whole can find no dynamic stability; the debate around the 'Anthropic Principle' reflects this issue. Activities such as self-reference, self-regulation, or self-realization, are all ways of actualizing that principle on various levels. The principle itself is not its actualizations. Practices leading to enlightenment can produce a singularity where the agent and his result are one and the same for a while; but this procedure is neither a necessary nor a sufficient condition for this unity, which becomes quietly sustainable (i.e., non-singular, instead of pointedly impressive) through the gesture of asking, querying, seeking to understand. It culminates in 'listening to the activity of listening,' which opens the door to the structure of the mind. Addressing unity in a fruitful way is possible only on a non-conflictual path, leaving away all personal interventions and desires—also those of achieving 'enlightenment.' Instead of experiencing that light, finding total transparency is the relevant

issue; awareness need not be sacrificed. Nothing can replace the actual practice of 'listening to listening,' letting pass away all words and imagery for the sake of remaining on track towards unity. Temporality remains only through introducing changes, and spatiality when entertaining differences. Sustained 'listening to listening' has a clarifying, purifying, unifying, healing effect. Even CEOs are now discovering this dimension. Evidently, monastic discipline and deep silence are helpful conditions. One can talk about the experience only afterwards, expressing aspects (here too fig. 1 is relevant). Gradually understanding the overall interconnections is the type of knowledge that is adequate to complete reality.

The advantage of the proposed tetradic categorization shows especially in borderline cases of the mainstream view—for example at the edge of life, in the way infants proceed into what usually is called life, and elderly people into what usually is called death. They do not do so in an object-oriented way, obeying the current scientific paradigm, but in a way that is rooted in the whole. Intrauterine and neonate life sets out in holistic sensations, increasingly attributing meaning to gestures (forms of ordered movement, mental as well as material), later associating the regularity of sounds with the regularity of gestures (this is called 'language acquisition'). Observe infants in how they move: they set out from their inner equilibrium, moving their feet and hands out of this sensation—at first not at all in the aim of going somewhere, but simply in experiencing and experimenting their potential of self-dis-equilibration and re-equilibration. The more an empirical scientific approach of these phenomena interconnects the details, the more it must acknowledge that infants develop meaning from the whole to the parts (see e.g., Stern [1992], Dornes [2001]), not as widely expected the other way around. At the other end, when old age gradually merges into the process of dying—we mentioned the crucial diffence between dying out of self-fulfillment and dying as an effect of alien intervention—, the inverse process can be observed: the less the process is disturbed, the more the affected psyche refers to the whole in gently shifting overall equilibria, letting go of particularistic object orientations (e.g., Kübler-Ross [1997], Albery et al. [1993]). Such a death can be totally peaceful—which is more probable when having led a tranquil life. At both ends of earthly life, the said holistic features can be observed empirically. This is not yet an explanation for their way of arising. But the proposed conceptualization offers that for the whole cycle of 'four seasons of being,' through precise ways of grasping perspectives of the overall order. It can be helpful for those in the humanities who feel they are in need of new prospects (Schaerer [2004]).

Applying the Proposed New Approach in General

The new unified approach, being fed by the intrinsic overall order, complements is a precise way the traditional ones, which are fed by their object-orientation (fig. 4). It operates out of fulfilled integrity: by going through all of oneself one can interact adequately with ever more forms of otherness—an aspect that is often debated under the title of 'alterity.' One can indeed grasp in otherness only what one has clarified—or at least become aware of—in oneself.

An ever more profound self-awareness is helpful for grasping the scientific process as a whole of aspects that interrelate in a specific way: the empirical side yields data for knowing concretely what we talk about, while the rational side yields universal concepts for knowing how to talk reasonably about data. Only both together allow science to function organically—as much in the single mind as on the institutional level.

In the habitual paradigm, one hopes to be able to reconstruct the whole through a synthesis of analyzed 'elements.' But regardless of how detailed a breakdown into 'elements' is, the thing as such can never be understood (as for example Kant demonstrates); then the considerations can never leave completely the mechanistic realm.

The practical applicability of the new approach implies first a translation process of the usual view for the phenomena into a view through the new categories. This translation effort is rewarded by discovering a new transparency in the structural parallels across the fields and disciplines, and by achieving finally also a higher overall efficiency of the research process.

Obviously not everybody is immediately interested in venturing into such a new field and form of action, even though there are many advantages in doing so. For those who choose this path, it is therefore useful to pursue simultaneously two tracks: a pragmatic interaction with present debates on the tactical level, while regularly feeding it by the activity of 'listening' into the overall order as the foundation on the strategic level. The approach proposed here is not adequate for manipulatory intentions, as the now usual forms of science are. It is no 'mental instant coffee', but requires patient care: it needs to be sustained. In fact, the sustained activity of 'listening' is what in classical antiquity was called hypokeimenon: the subjacent basis which allows (material or mental) 'things' to become what they finally are; the polarizing arrows in figure 2 can indeed easily imply, in mental practice, the effort of a few decades (as documented by many examples in the history of philosophy).

The sciences implied in the considerations of this symposium on monitoring are rooted at their one end in natural science, and at the other end in policy making and hence in the social sciences and humanities. The symposium emphasized the triad of 'ecological, economic, and social' points of relevance. This intention can be rounded off by considering that all beings are a living span between their material organization and their way of handling their own overall order. So three basic conceptual aspects are relevant for their wholeness: their material body, their intrinsic order (law-plus-force) that organizes it, and the oscillating mediating 'something' that produces the individual movements, which actualizes the principle of self-equilibration. The difference between inert structures and alive ones is only that first are fully determined by exterior influences; what the self-modifications are attributed to—a genome, an entelecheia etc.—is another question (for details see Schaerer [2002]). For coordinating conceptualizations, three fields of contemporanean science are conceptually critical and can be particularly fruitful when newly being based on an uncompromised way of 'theoretical theorizing':

- theoretical physics (understanding matter),
- theoretical biology (individual mediation),
- theoretical economics/social science/humanities (making explicit togetherness).

For the time being, a clash of ideas is still going on—beyond the clash of scientific cultures (C.P. Snow) and the clash of civilizations (Sam Huntington). It is an ideological war between minds seeking domination and minds seeking understanding. Maybe we can offer
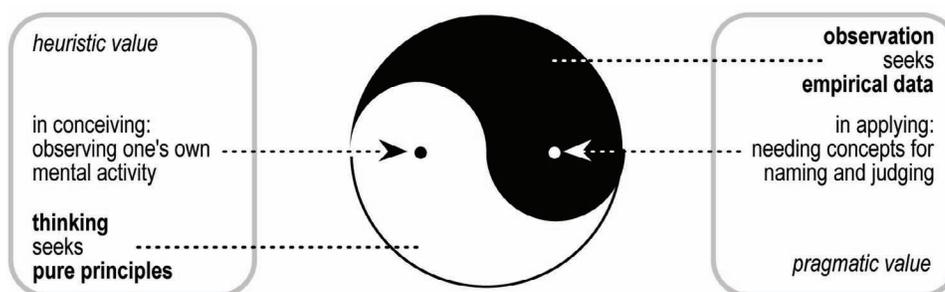

Figure 4. The scientific endeavor as a coherent organic wholeness capable of housing conceptually all life.

a bridge. For the moment it is still easy to seduce many people with what they can 'do,' not with what they can understand. Problems like sustainability are like catalysts in the process of reconsidering.

Of all natural sciences, the geosciences are especially interesting (and relevant in questions of sustainability), because they need to integrate methodologically the full scope between the mineral, vegetative, animated, mental and social levels of existence—the more seamlessly, the better. In all of its realms, 'systematic attentiveness' offers significant conceptual advances. On the level of pure natural science (physics and chemistry), an approach to the nature of matter is possible that can encompass life as a principle. Matter reveals itself as never being causal, but the indispensable condition for all processes. Grasping this difference—which can't become clear in habitual approaches (think e.g., of the deductive-nomological schema of causal explanation)—can liberate science from many burdens. In physical geography, the pragmatic categories of 'accumulator,' 'regulator' and 'process' can be reduced to the principle of 'process', thus simplifying the terminology. In climate studies, the constitutive notions of 'energy' and 'information' can be purified towards their real meaning. Both are not suitable for a strictly integrative view, since neither is a really fundamental concept. In the lithosphere the edaphon with its interlacing inert and alive structures can be approached terminologically in a unified way, avoiding reductionist paths; then for example ion exchanges, chemical weathering, and a mykorrhiza can be contained in a homogenous conceptual grasp. In geoecology, the existence of homogenous landscape units can be approached through the idea that such units arise where specific parameters warrant a dynamic equilibrium; this avoids anthropocentrically 'intuitive' definitions (e.g., via watersheds), since the parameters can objectively be studied until finding a homeostatic overall order. In biogeography, the hitherto mysterious link between the mineral and biotic realms can be approached through the principle of organs regulating sub-equilibria of the overall equilibrium—without the fallacies of the physicalistic or geneticist sort, where order and agency can never become ultimately clear, with the result that it was superseded by a belief whereby nature works in the same dominative way as humans try to justify for their own doings. How come a blade of grass can grow gently through concrete, where we must use a pneumatic drill? In human geography, the question of autonomy and heteronomy, freedom and constraint, can be solved in a non-conflictual way upon having unmasked the conflictual ways of hitherto usual science and intervention. Traditional riddles such as the 'mind-body-problem,' personal identity, or the freedom and unfreedom of will,

become transparent in the proposed categoriality. In the structure of sociality, the efficiency of decentralized intelligence can become clear—as opposed to the hitherto favored model of centralized processing and command, whose apparatus entails unnecessary burdens. The best oil in the social gearbox is the autonomous capacity to think things fully through; no wonder it bothers those who wish to free-ride the social engine for their own ends. Finally, on the level of the purely theoretical geosciences, an overall categorial order can be found in which many old inconsistencies and incompatibilities can be leveled out. The proposed approach allows to address all types of entities, processes, and issues, on all scales, in a conceptually homogenous way.

Closing Remarks

The essential element of the presented proposal is the gesture of 'listening' to the problem at stake, instead of 'talking' into it, mentally 'pulling' instead of 'pushing,' 'sucking' instead of 'pressing,' i.e., seeking to understand fully instead of wanting to dominate. As has been shown, neglecting this ideal inevitably produces a fundamentally conflictual tendency already on the level of theorizing. In our era, blinded by short-term success of techniques, this neglect became habitual. The result is a lack of long-term certainty, or in other words of sustainability. This systematic drawback has its root in unawareness of one's own mental life and can be overcome only by becoming aware of this fact. In spite of its deep reach, the proposal of fundamental 'listening' instead of 'talking' can be understood by anybody, in whatever culture.

When pursued philosophically on the categorial level, this basic gesture allows a type of conceptualization that does not entail the cognitive self-limitations which characterize today's mainstream methods. The proposed approach requires, however, a particular dedication to the questions at stake. Pressures of whatever kind—conceptual (for instance paradigmatically, as in the 'science wars'), political, economic, etc.—as they often are being applied to the research process, are not conducive to circumspection; overall efficiency can't be achieved by pressure. Such pressures do not arise accidentally, however, they rather are a result of society struggling with malice while many judgments are muddled up by psychological projections (that darned phenomenon of not seeing the beam in one's own eye, but only the straw in other's). There is much need for more (self)-transparency—and 'listening' instead of 'talking' is the best method for that because it covers as much 'inner' as 'outer' reality, in a complete way. It is helpful also for discovering the primal source of malice: conditioning

influences in infancy and childhood, which reach much more deeply than many would acknowledge, and yet are fully man-made.

A presence or absence of 'listening' instead of 'talking' as the socially effective basic gesture is thus not only of vague academic interest, because its material consequences reach extremely far. Think for instance of the 'youth bulge'—the high birth rates in certain areas of our planet, where simultaneously the young generation faces poor prospects and develops corresponding revolutionary desires, reproducing the basically conflictual gesture that Western influence had imposed, leading them to where they are now. This is now being discussed among strategists (see for example www.cia.gov/nic/speeches_demochange.html, www.populationaction.org, or www.wilsoncenter.org, www2.ucsc.edu/cgirs). Also in this explosive problem area, the usual intellectual response is only blown-up tactics, it doesn't stem from a truly strategic overview. Discussing the problems in terms of subjectivity and fighting for one's 'values' and 'interests' will not solve them. In actual policies, contraception, professional training and job creation is not enough, because such measures miss the origin of the vicious circle, they merely shift the problems into new areas. And wanting to control violence by the type of counter-violence that is organized by the state, as has become habitual since Max Webers view of the state, will never lead to the intended social order, but to always new forms of conflict flaring up. Hiding the crux in structural violence—for instance by instrumentalizing jurisprudence—is of no help. Under the practical conditions produced by superficial analyses, for example the gesture of wanting to grab resources under the impression of being in need is understandable—which gives rise to the problems of sustainability.

A sustainable solution requires the effort of thinking through the overall interconnection of facts in a strictly complete and totally secure way—including therefore the categorial system through which the facts are being interpreted. To mention only the problems on the economic level: the questions raised by thinkers such as Marx, Veblen, Myrdal, or Georgescu-Roegen, can't be solved by putting them aside for long enough, as is believed in the lore of mainstream (neoclassical) economics. For being able to evolve in constructive ways, the young generations need fundamentally true prospects, a materially and intellectually open horizon. The now still habitual approaches, methods, and theories can't warrant this. But this is not the end of the story: limits of understanding are not our fate, they are always only provisional and merely reflect the fundamental beliefs of the day. Doubting dogmas and 'listening' to the problem at stake, instead of 'talking' into it, is always a possible option.

Even Zbigniev Brzezinsky, who has an excellent grasp of the international situation and certainly is not a friend of demure attitudes, is gradually realizing the problem to some extent—not generally in the role of methodological work, but pragmatically in the problem's practical impact, for instance in losses of credibility. In his latest book [2004], Brzezinsky explicitly cautions the United States to seek global leadership instead of global domination. The outlined methodological considerations allow to know in a secure way that any limit in achieving this ideal will always be determined by limits in the sincere desire of understanding all the implied facts and interconnections in a complete way—beyond still widespread basic beliefs—and by taking materially a position that enslaves others in whatever way. The ideal of not limiting each other's liberties has always been a powerful part of the American self-understanding, but—as a few massive aberrations have been revealing lately—materializing it requires some better thinking than the average optimism can warrant.

But it is necessary to realize that good thinking outside the box requires at least as much precision and discipline as the rigor of which especially so-called 'hard' sciences are proud—the strictness is merely on another level. Their feeling is nevertheless not completely off track since the 'soft' sciences neglected the foundation of their own way of thinking. In contrast, the categorial instrumentation proposed here allows to cover seamlessly both sides. Making use of it, investigating and monitoring can cover also the hithero neglected aspects of its objects in the traditional sense, as they can then be approached uncompromisingly in their processual nature and specific degree of autonomy. The method for doing so is to think in a secure way from totality towards its aspects, encompassing also the principle of categoriality, i.e., the conceptual instrumentation through which any subject matter (for instance 'objects') is being dealt with, including thus the activity of thinking about them. This must seem impossible in today's mainstream of philosophy, philosophy of science, and science; the present essay is an attempt to outline an unexpected feasibility—thus hopefully encouraging those who always wanted to go beyond the alleged impossibilities, but could not get beyond wondering how to do so.

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