right2unite
independent think tank

Third Phase Transition

SOLVING THE ANTHROPOCENE CRISIS

Preface & Introduction

Publication plan

Third Phase Transition: Solving the Anthropocene Crisis, will embrace two parts, divided in seven books, apart from this freely downloadable ***Preface & Introduction***. The introduction below frames the problem in a natural historic context. The seven books will cover the origins and characteristics of the Anthropocene crisis, as well as the possibilities opened by it. **Part I** will deal with twentieth century history, its character as phase transition in socio-natural co-evolution, and how it produced the Anthropocene crisis. **Part II** will discuss preconditions and prospects of a solution.

Part I. Twentieth Century Results
THE ANTHROPOCENE CRISIS

Book 1. Abstract Capital: Causing and Driving the Anthropocene Crisis

Book 2. Democracy: Substituted Right of Association

Book 3. Restorationism: Spread of Obsolete States and Wage Labour

Book 4. Criminalization: Barbaric Liquidation of Class Society

Part II. Third Millennium Prospects
SOCIAL MUTINY

Book 5. Social Mutiny: Revolution's General Form

Book 6. Right of Association: Human Nature

Book 7. Anthropy: Globally Advanced Circular Metabolism

Third Phase Transition

SOLVING THE ANTHROPOCENE CRISIS

Preface & Introduction

Contents

ABSTRACT

Anthropocene, as new geological epoch at Planet Earth, is no accomplished fact. I might only be achieved by solving the Anthropocene crisis. That requires a natural historic leap in self-evolving human nature – a third phase transition in socio-natural co-evolution. The first phase, harvesting metabolism of hunter-gatherers, had manifested cooperative survival skill, a first-order approximation to human nature. The second phase, linear metabolism of civilization, has elevated and expanded self-organized right of association – the second-order approximation to human nature – to span the whole globe and the entire species. Survival of humanity, and of the Cenozoic life system, the independent variable of which *Homo sapiens* has become, now depends on rapid and consciously purpouseful re-integration of the two, as collective intelligence in the earth system. Such globally advanced circular metabolism, which requires generalized associationism and is incompatible with class society, would realize human nature by its third-order approximation – Anthropy. Taken down to Earth, from lofty cosmological speculation, the anthropic principle might be established as common formula of general scientific integration, and as socially organizing principle of completing the third phase transition, at one and the same time. Human agency has evolved to such a combined level. Social mutiny finds its range there.

PREFACE

Are we now in the Anthropocene, a new geological epoch brought about by human impact? That matter is still an open question. We are in the Anthropocene ***crisis***! Transition into a third phase of human natural history might be possible. General talk about a human geological epoch at Planet Earth, however, as if it were a completed result, is risky. It might turn into a meaningless play on words, a distraction from the necessary vigilance and energy needed in the Anthropocene crisis.

The effects of the Anthropocene crisis are bursting forth as a massively combined crisis in human society and in Earth's life system. To understand this crisis, it needs to be analysed comprehensively. The term Anthropocene has been proposed, since a unique combination of social and natural history is globally interacting directly for the first time in the existence of Planet Earth. Earlier human impact had been assimilated into the changing earth system, by margins of redundancy inherent to the resiliency of its global ecology. Now, humanity makes inadvertent global change in the earth system. And this process is accelerating.

The present work is focusing the great deficiency so far, in analysing the Anthropocene crisis. How long can we afford discussing the advent of it, as a human-induced crisis in the biogeochemical system of the planet, without seriously treating the variable causing and driving it?

It does not help much to generally state that human impact is this independent variable. Nor will pragmatic detailing suffice any longer. Hence, it is not enough summing up measurements of effects, interpreting them and modelling specific kinds and cases. Such procedure details critical dependent variables. A problem is, however, that it still tends to lump together dependent variables of a natural character with those of a social character. The missing link is that no serious

efforts have been undertaken to isolate and analyse the independent social variable of crisis aggravation.

Human impact is being studied by natural scientists, as separate effects from different activities. Earth system science has emerged and established itself as the synthesizing research program. Research done on human disturbance, interfering with ecological resilience in separate respects and at various scales, had by the millennium accumulated to a critical point, where the Anthropocene hypothesis resulted. A hypothesis that is rapidly establishing itself, as far as study of its critical initial conditions are concerned. Continuous research fills out the picture, providing additional evidence, motives for radical change and innovative inspiration. Nature's dependent variables within the earth system, including climate change, stratospheric ozone depletion, oceanic acidification, global eutrophication in nitrogen and phosphorus cycles, overexploitation of land and freshwater, chemical pollution, atmospheric aerosol loading, are under increasing scrutiny. The crucial one, in which all the others are compounded, is the incipient decline in biodiversity. Will we enter an Anthropocene epoch, or is the entire Cenozoic era – time of the mammals – coming to an end? That is how the question stands.

Reports on threatening climate change have entered the public debate. We now speak of the 'climate crisis.' That is a great step forward. An even greater one is the reports on mass extinction of species gaining common currency. This spreading of consciousness, as to the seriousness of the problem, calls for Anthropocene research to take the problem of the independent variable seriously.

The independent variable is not accounted for by citing statistics on global population growth, which has been common in the field so far. That variable has for decades been demonstrated to be a dependent one. It is not the one causing and driving the great acceleration of global change. By itself it is a social part within it. Prognoses already show a tendency of flattening out or waning. A rapid levelling of global resource distribution is what it takes for this tendency to get full impact.

As it comes to understanding what immediately drives human impact, however, we need to be much more precise than at present. Definition of this independent crisis-variable affects the possibility of approaching a solution that could match the problem. An inclusive analysis of twentieth century's social development should provide an answer to the question of great acceleration's immediate driver.

If this problem is not being tackled, political opportunism towards destructively and obstructively dominating social interests, together with divisive moralism towards the individual mass consumer, would continue confusing matters, shattering efforts, and paralysing community of purpose. The political left's

general references to capitalism and greed, or the pragmatic political tampering of the Greens, mostly contribute to benumbing moralism and already disqualified politics.

The human phase transition that we are in, of our metabolism within nature's life system on Earth, can only succeed by becoming a phase transition in the earth system itself. And it can only be studied seriously by putting social and natural history in a common perspective. A few things can be stated immediately. The third human phase transition will be the first one ***consciously self-organized***. It needs to be incomparably ***more rapid*** than the former two – out of the animal kingdom and into civilization, respectively.

The evolution of human society should be analysed as part of natural evolution. These two paths of development have interacted at an increasingly unequal speed and under tendentially rising tension. Now they coincide and collide. Human impact has been spreading in scope, but above all it has been historically accelerating.

As we deal with the fact that humanity is presently becoming the decisive part of the earth system, the question of human nature cannot be avoided. It concerns the independent variable of solving the Anthropocene crisis. What fundamental qualities of *Homo sapiens* has brought it from an endangered species, evidently consisting of no more than a few thousand individuals in its early history, to a dominant one today, altering the earth system at the magnitude of a global natural force? Only in answering that question, the problem of solving the Anthropocene crisis can be treated in a realistic way.

Now *Homo sapiens* is acutely endangered anew, but this time for the opposite reason than at its origin. The global impact of our kind is setting off the sixth mass extinction of species, threatening the result of the last 65 million years of bio-diversification. What was the main trajectory of the last 200,000 years of socio-natural co-evolution, that proved to end up here? Where exactly are we now along that path? The introduction to this work will outline these issues.

The present crisis is accelerating. That much is clear. But what is the relation between the great acceleration of global change in the earth system, which has occurred over the past decades, and globalization of human society during the same timeframe? How should this relation be understood, as a result of the last 200,000 years of socio-natural co-evolution?

How could this accelerating human force, still blindly funnelling in this combined crisis, be purposefully bending from aggravating the crisis to solving it? Where are the social interests most clearly, forcefully, and directly expressing that common need? How do they relate to the nature that human speciation has

resulted in? How could such social forces be consciously uniting and focusing the challenge? By what means? For a challenge of unheard-of proportions, it is. There is no reason to believe that a social change of lesser scope is required, than our transition from a part of the animal kingdom to the first human phase of hunting and gathering, or from this first phase of harvesting metabolism to the second one of human civilization, with its linear metabolism.

The aim of the present work is to propose adequate concepts for this urgent situation. *Third Phase Transition: Solving the Anthropocene Crisis* will be the first text published by the independent think tank under formation, *right2unite*. This work will be divided in two parts.

The first part, *Twentieth Century Results: The Anthropocene Crisis*, intends proposing a conceptual framework for understanding the past century and how it produced the Anthropocene crisis. It will be divided in four separate books.

The second part, *Third Millennium Prospects: Social Mutiny*, spanning three books, will focus how human nature has developed to a point where scientific self-consciousness has become possible. This is precisely what is required to associate the crucial development features already massively progressing in human society. By generalizing them in a common self-organizing principle, corresponding to the present development level of human nature, the Anthropocene crisis might be solved.

The following introduction to these two parts focuses the general question of human nature. By introducing this work in such a long timeframe and referring to such fundamentals, briefly outlining human natural history, a sound foundation is hopefully laid for the more specific problems treated in the seven books of this two-part work.

Third Phase Transition is the result of two decades of preparation, collected in unpublished work papers and research notes. The present work started to take shape fourteen years ago. In extensive discussions with my wife, life companion, and collaborator, Susanne Westling, the core ideas started to develop. The introduction now published would hardly have been readable, were it not for her meticulous proofreading and suggested changes. Of course, remaining errors and shortcomings are my responsibility.

Stockholm
2020-07-15
Leif Almqvist

INTRODUCTION

Anthropocene research has revealed a planetary life crisis. One species had singled itself out within natural evolution. Firstly, this species had a unique propensity for cooperating. This feature had become decisive to its survival possibility. Secondly, its cooperative disposition gave capacity to unite on an ever-larger scale and at increasingly higher level. Humanity could start associating in collectively conscious labour. This capacity for taking the right to associate, in self-organizing survival struggle, contains the entire explanation for the unprecedented success of our species. Right of association had become a self-organizing quality. Precisely this quality has now reached a magnitude, which might be compared to a global natural force.

Hence, the cooperative survival skill, genetically selected for and starting out socio-natural co-evolution, is a ***first order approximation*** to human nature. It manifests itself in developing means of cooperation. Its ***second order approximation*** is the rising level of association, resulting from human self-organization.

The sixth mass extinction of living species has begun. Human impact is causing it. Humanity alone can solve the Anthropocene crisis progressively, escaping the earth system tilting over into an evolutionary relapse. Avoiding this requires an historic leap, in the development feature which made us so dominant. Only association, purposefully conscious, globally united, locally dense, and constitutionally self-organized in equality, could be powerful enough to achieve this.

The leap itself would be humanity re-integrating into nature's circular metabolism, thereby ***advancing its own nature*** in accordance with its third

metabolic phase. Our species has been progressively changing its nature by self-organization, throughout socio-natural co-evolution. The challenge of the crisis itself will act as a common scientific discipline.

However, such a path is still blocked by the disintegrating class society, causing and aggravating the Anthropocene crisis. Social mutiny is already underway. It is trickling out of massively accumulating human needs. These are starting to break through the monopolized resource control of class society. But social mutiny is still unconscious of its own common nature and of its inherent power yet untapped.

Habits, traditions, institutions, and the disciplines corresponding to them keep blinding, by wielding a tattered authority they no longer merit. The prevailing principle of association by class division, characteristic of the second phase of human metabolism, had been the powerhouse of civilization. Combining the motive forces of human cooperative development with the incentives of class society, channelling, amplifying, and extending this cooperative development, humanity had achieved to grow from local isolation and meagre material conditions to accelerating labour productivity, and eventually merging into global interconnectedness. Cooperative development and class division once were as synonyms, the latter expressing the former under unevenly scarce conditions. Now, however, they have become opposite and incompatible, as demonstrated by the Anthropocene crisis. Sorting these things out is the purpose of the first part of the present work.

The subject of the first book will be to isolate and describe the independent variable of self-liquidating capitalism, abstract capital, which is causing and driving the Anthropocene crisis. Capital abstraction and industrial repulsion is demonstrated as general form of class society's associating disintegration.

Books two, three, and four, will analyse the political and social consequences of class society's destructive perpetuation, beyond its social and natural sustainability. These consequences are demonstrated to be dependent crisis variables. But they also contain the elements potentially forming the independent variable of crisis solution, by their acceleratingly developing means of cooperation.

The second part will focus the latter aspect. It will treat the subject of crisis solution. Now there exist abundantly accumulating human motive forces and means of cooperation, potentially capable of solving the Anthropocene crisis, if only liberating themselves from obsolete class society's destructive interference. Such a completion of the third phase transition has got the quality of one uninterrupted, self-disseminating and accelerating process – social mutiny – corresponding to the species completing its self-organizing nature.

Twentieth century history provides ample demonstration of social mutinies breaking out. It also demonstrates how social mutiny, when aborted through political substitution, and lacking awareness of its own self-organizing principle, necessarily has produced violently reactionary results. Some of the most important events and processes illustrating the motive forces of social mutiny and the potentialities inherent to it will be invoked as examples in the first book of the second part. Social mutiny, as an expression of human nature under the conditions of class society, explains its latent or potent presence as an integral part of civilization – indeed its transformative force.

The second part will proceed, in a second book, through investigating the ***right of association as scientific principle of human evolution*** and how this principle of emerging human nature is presently confronted by the possibility of re-integrating into the planetary life system. Several concrete principles, corresponding to emerging massive development features of society, will be demonstrated as both conductive to and deductive from this general principle.

The third and concluding book of the second part will attempt synthesizing and concretising concepts of humanity transcending into globally advanced circular metabolism, as independent variable of a progressively stabilizing earth system – the ***anthropic principle*** as scientifically testable concept. Above all, it will focus the concrete principles, methods, and standards involved.

The disposition and publication plan of the present work is published together with this introduction, including abstract of the first book under preparation. The first part will focus twentieth century history, tracing the emergence of the Anthropocene crisis. The second one will detect global social mutiny as the road to progressively completing the third phase transition. It will base this conclusion in the overall scientific principle of human evolution – the right of association. And it will tackle the concrete prospects of sustainably re-integrating humanity into the earth system.

Thereby, a ***third order approximation to human nature*** is formulated. The first order approximation – ***cooperativity*** – corresponded to what had evolved out of human self-organization within nature. It had resulted in the first phase of human metabolism – harvesting metabolism. The second order approximation – ***segregated associationism*** – corresponded to the second phase of human metabolism – linear or exploitative metabolism. The third order approximation – ***integrative associationism*** – corresponds to what might be achieved within a third phase of human metabolism – globally advanced circular metabolism. That means humanity reintegrating within itself, and within the naturally evolving earth system.

The two-part work will focus twentieth century results and third millennium prospects. This introduction, however, moves in the other direction. It starts out by evolutionary retrospect, by focusing some basic conceptualizations on human nature, in order to frame the problem broadly enough.

Three phases of human metabolism

'Metabolism' is a concept borrowed from biology. The term is not here used as a simple metaphor. That seems to have been the usual practice when applied to social analyses. Here it is rather utilised as a distinct re-conceptualization, transferred to society. Neither is it applied to concrete processes at the shorter timescale. It is utilised as an overall concept for a distinct type of human interaction within the circular processes of Earth's biogeochemical life system, characteristic of a separate period in human evolution. Evolution has gone through two metabolic phases: harvesting metabolism and linear metabolism. A third phase is now possible: globally advanced circular metabolism.

'Phase' is here utilised as a concept for determining separate forms of human-ecological metabolism, at a planetary range, and at a timescale of socio-natural co-evolution. 'Phase transition' refers to socio-natural critical conditions leading from one metabolic phase, which had depleted its potential, into the achievement and stabilization of an entirely new and different phase, proving its sustainability in a natural as well as a social historic meaning.

As revealed by the Anthropocene crisis, an acute need has appeared of conceptualizing the metabolic modes of socio-natural co-evolution, that human speciation had produced. After completing two metabolic phases, interaction between *Homo sapiens* and the earth system has entered a critical state – a third phase transition. We need a phase concept for understanding what this phase transition is. What are the limits of the phase we are leaving? What is the phase we are entering? What has the present phase transition resulted in so far? What are the conditions, dimensions, and prospects for successfully completing it, for humanity transcending into a sustainable future? All the great questions of our time require a scientific concept for periodizing socio-natural co-evolution.

Together, the first two metabolic phases have expressed a natural historic evolutionary process of human cooperation, the distinguishing survival fitness of our species. However, they mark entirely ***separate rates in developing means of cooperation***. These, in turn, correspond to ***separate levels of human association***.

Such qualitative distinctions are of course also applicable to a possible third phase of human metabolism.

In fact, with modern humans, it has not been genetically driven development of the species, but rather the dialectics between changes in the earth system and *Homo sapiens's* social evolution of combined responses, that has led its advancement in socio-natural co-evolution.

The phase concept here proposed should not be understood as a straight line within social history. The simplification of linear historiography has been devastating, denying ***intercultural cross-fertilisation***, the prime force of human cooperative evolution. The linear conception of history is also hierarchic. This feature reflects class society's outlook on mankind, today representing the chief obstacle to seeing the solution of the Anthropocene crisis. Intercultural cross-fertilisation between remaining unevenness in social evolution will be transformed into a decisive asset of crisis solution. This will be briefly dealt with below, in the section on circular metabolism.

The phase concept should not be interpreted mechanically (determinism). Nor as something predetermined (teleology). It should be determined as a tool for evaluating the uneven and combined results within the earth system of human speciation, and of the natural historic shifts in human cooperation produced under pressure of environmental feedback. The present state within humanity and within the earth system – the Anthropocene crisis – necessitates a phase concept in such a natural historic meaning.

Understanding the intimate interconnectedness of natural and social exploitation, characteristic of the entire second phase of human metabolism within the earth system, will prove completely decisive for approaching, apprehending, analysing and acting effectively within the present phase transition out of linear metabolism, culminating in the Anthropocene crisis.

Of course, the Anthropocene hypothesis, forecasting a new human-centred geological epoch at Planet Earth, needs to be distinguished from the Anthropocene crisis, the ongoing phase transition discussed in this work. The Anthropocene crisis is a fact. This does not apply to the Anthropocene. The possibility of an Anthropocene epoch, with humanity perpetuating the Cenozoic era (the evolutionary time of mammal speciation), depends entirely upon the solution or non-solution of the Anthropocene crisis. Whatever the proposal of the Anthropocene Working Group within the Subcommission on Quaternary Stratigraphy eventually will be, it is not at that academic level that the issue will get settled. Any other conceivable timing of an Anthropocene onset, than that possibly evolving out of the Anthropocene crisis itself, would prove untenable. The associated actions of billions of people within the near future will decide.

The first phase – harvesting metabolism

The first phase should be termed harvesting metabolism. The early beginnings of hunting and gathering might be traced a few million years back. That is if we include the first hominins, the ancestry which was to be progressively characterized by features like upright walk, handicraft, control of fire, development of language, collective accumulation and transmission of knowledge and practices through generations. But *Homo* would prove to be the successful genus and *sapiens* its only surviving species. Eventually it would become globally dominating. Therefore, the entire evolution of hominins up to *sapiens* should be conceptually determined as a first phase transition. In retrospect it can be conceived of as leading out of the animal kingdom and into self-organizing and collectively self-evolving human society.

Restricting the phase concept to *Homo sapiens*, and to several contemporary and closely related species now gone extinct, the phase of harvesting metabolism spans a few hundred thousand years. The exact dating, socio-genetic causation chain, crossbreeding of species, socio-ecological feedback loops, indicative set of species-specific features, cultural breakthroughs, et cetera remain open to conflicting interpretations, which in turn have varied over time. These issues, however, are not essential to the basic conceptualizations proposed here. The period from the emergence of modern humans and up until the Holocene, which roughly corresponds to the Penultimate and Last Glacial Periods, would then be considered the phase of human harvesting metabolism.

The nomadic mode of living, and the migrating tendency, bear witness to human developments still being a restlessly embedded part within natural evolution and, at the same time, its tendency to increasingly segregate through cooperation. The hunters and gatherers were still following the food to harvest, fleeing unhospitable conditions of rapid and radical climate change and more short-term natural devastation, et cetera, just like during the first phase transition. In this respect, the humans of the first phase might be perceived as still bearing some external resemblance to foraging and hunting animals. But in their internally combined type of struggle for survival they had become radically different. Natural evolutionary they were already our equals, although still socially hindered by more scarce means of cooperation.

Natural selection had manifested itself, to a rising degree throughout the first phase transition, in mental capacities substituting for and atrophying those of physical force. This because the survival fitness of our pre-speciation had been drifting increasingly from individual features towards those favouring socially organic combination. A distinctively collective speciation had emerged. Our species had eventually resulted from genetical selection for cooperative qualities.

And cooperation itself had increasingly been driving and boosting this selection, up until the occurence and success of modern humans.

The organizing principle in primordial accumulation of knowledge had reflected humanity's progressing alienation from the tendencies of natural evolution. The natural surrounding could consequently only be perceived by humans as forces cooperating with or against humanity. The first self-insight into human nature had necessarily been inverted, into animating nature (animism). Human cooperation had intuitively been projected everywhere. Religion sprang out of this speciation's alienation from natural ecology. It became the original substitute for science. It had been echoing a human cooperation, that had not yet reached a rate sufficient for systematic cultivation of, and enquiry into, the regularities of nature. It had also reflected that human impression of its own species-specific cooperation had already become overwhelming. It was for the love of cooperation that human culture had been evolving. A culture which, in turn, had been perpetuating and enhancing cooperation. And humanity had rationalised this socio-natural dialectic, through setting its own evolutionary achieved right of association as a constituting principle of not only itself, but of entire nature.

For most part of this first phase, an unknown number of hominin species had coexisted evolutionarily. Recent findings show that Neanderthals, Denisovans, and others were to partially become assimilated into *Homo sapiens* through interbreeding. Gene sequencing has also shown that all humans living today have their common dominant genetic ancestry in a small endangered population. The epic drama of our species seems to have started out by a near extinction-experience, at the continent where twenty-first century phase transition will have its epicentre – Africa. Once more, most vital in human and natural resources, the fate of the continent will be decisive. Spiral closing.

How come only *sapiens* made it? And why did this critically small population of *Homo sapiens* reach such unparalleled evolutionary success? It would be far-fetched to seek any other explanation, than its natural selection conductive to a uniquely supreme cooperative survival skill.

At the interface of humans and surrounding nature, *sapiens*, as well as other human species, had conquered one decisive natural force – the control of fire. After the human fire regime had evolved, from preserving embers of wildfire, to proper making of fire, an artificial regularity had been introduced into the circular processes of natural ecology. Human society's fire regime had become an ecocycle in the earth system. Human needs for shelter, hunting, cooking, and clearing of ground, had benefitted plant and animal species adapting to regular fires. Savanna had spread, and with it the grass eating mammals, suitable as

human prey. Thus, human cooperativity had begun changing the ecology of Planet Earth. Finally, burn beating would become a forerunner of agriculture.

Preparation of meat and plants had brought with it a radical reduction in energy required for human digestion. It had shrunk to a fraction of what was needed by animals. Increasing size and energy consumption of the human brain had been provided for by harnessing fire. This had further increased the power of cooperation. Cooperation and fire had become a self-reinforcing evolutionary spiral, leading up to modern humans. Human use of the unique consumption power of fire had amplified that of harvesting metabolism. The original human fire regime had ignited a take-off, in socio-natural co-evolution.

However, according to present state of the art, it does not seem like this singular conquest of natural force would have played a principle part in driving the successful harvesting metabolism into crisis. It seems like the very general success of the species had had a more decisive significance. At the beginning of the Holocene, around 11,000 years ago, the cooperative skill had not only spread our species to the entire planet. It had brought it to a popular density, where the consumption power of harvesting metabolism had threatened to turn into a destructive power.

Sticking to harvesting metabolism would have tended to lead to a general plunder crisis. Sudden climate change, in combination with human overkill, had led to extinction of megafauna in entire regions and even continents. How much of this ecological crisis that had been caused by natural climate change, and how much by human consumption stress, we might never really get to know. Regardless, the socially prehistoric challenge posed to human cooperativity, and its capacity to meet it through the Neolithic revolution, should inspire us today.

The second phase – linear metabolism

This threatening plunder crisis was solved by human cooperativity undergoing a fundamental revolution, facilitated by the uniquely stable and hospitable interglacial conditions of the new geological epoch. Early Holocene formed a phase transition in the interaction between human cooperation and surrounding nature. Its breakthrough is commonly known as the Neolithic revolution, or the First Agricultural Revolution. Harvesting metabolism was giving way to the beginnings of linear metabolism. Sedentary development of human society was self-organized through co-domestication and cultivation of successively selected plants and animals. The horticultural glades of late harvesting metabolism were extended into virtual fields of agriculture. The resilience of ecosystems would

prove to be robust enough to allow for such systematic human exploitation of the soil.

Cooperation was refined by functionally dividing itself, in the form of human labour. Peasant agriculture formed the first human mode of production. Human labour and its tools, together with the natural forces of settled areas, were transformed into forces of production. Henceforth, ***development of productive forces*** became the general ***self-organizing principle*** of humanity, successively selecting for production relations conductive to furthering this development.

Science as such is a human category, which became possible to apply to surrounding nature, by human cooperation refining itself into social labour, a permanently self-evolving, systematic, and specialised belabouring of nature's regularities. Within the cooperation of the human mind, such scientific inquiry and discoveries began to infiltrate the religious superstition inherited from the first metabolic mode.

'Principle,' as utilised in this work, when not explicitly referring to scientific principles of natural sciences, should be understood as a scientific approximation to socio-natural co-evolution, the organic interaction of human cooperation and natural evolution at Planet Earth. 'Principle,' 'organizing principle,' or 'self-organizing principle' are used for conceptualizing human cooperative evolution and its historic development forms, advancing the phase of socio-evolutionary metabolism in which they exist. Hence, developing productive forces through human production relations, did emerge as the general self-organizing principle of linear metabolism.

A denser and larger human population could be fed in an area sized a fraction of former hunting grounds, albeit at the cost of a more unbalanced and nutrient-poor diet, dominated by cereal staples. Produced necessities could be stored as social reserves, buffering seasonal shifts and potential devastation brought by drought, flooding, pests, et cetera.

Exchange of such accumulated surplus re-invigorated variation in diet. This, however, brought with it even more important things. Interchange in mating counteracted deleterious inbreeding. Exchange of accumulated knowledge set out intercultural crossbreeding. Human needs were diversified. The scale and density of human cooperation increased exponentially. Handicraft and trade formed the organizing principle of urbanization, a general tendency of intensifying association that was to accompany the entire development of civilization.

Families, gathered in clans, would associate in tribes, that in turn federated, transforming into chiefdoms and proto monarchies. Conglomerates of various

ethnicities and socially differentiated populations, spanning vast areas, were to give rise to politics as mighty groups' meta form of cooperation.

The second phase transition was to end, and the beginnings of the second phase was to start, with the advent of class society. How? Why? In an immediate sense, class society had arguably been unavoidable in stabilizing human civilization and escaping violently chaotic disintegration of human cooperation. For during the phase transition from harvesting metabolism to linear metabolism – proto history – the practices of hunting and gathering had been turning upon humanity itself. Self-segregating tribal aristocracies had been self-organizing in exploiting their powerful social position. The human right of association had started to become monopolized. Rich and powerful men, at the head of dominant clans and tribes, had fortified their kinship into dynasty. They had been thriving through wars of plunder. In its most absolute form, it had been represented by the warrior tribe, like Sparta. A few cattle-breeding tribes had formed a specific form of cooperation in civilisation's proto history, advantaged through high-grade nutrition and rapid mobility, predisposing them as successful warriors. Such lines of development would culminate in the form of early empires.

Honour culture of proto history had been idolizing brutal force. Torture, manslaughter, rape and enslavement of foreigners and internal competitors had been upheld as heroic virtue, as displayed in for example the classical Greek drama, or in the Icelandic *Eddas*. Productive agricultural labour had been stigmatised as a despicable characteristic of poor people, slaves, and draught animals. Such traditions had not only been nonconductive to development of productive forces, except for those directly applicable to armament, mobilization logistics, amassing of wealth and celebration of Emperor cults. They had also been threatening to degenerate into society's dissolution in unbounded criminality and civil war. Especially the practice of enslaving a failing debtor had been a threat constantly looming over labour.

The labouring peasant majority, subjected to societies' recurring plunder crises, had tended to rise in social mutinies against the warlords. Populations of ravaged and threatened cities had been teeming with sympathy for social mutiny. Large concentrations of slave labour had formed a latent explosiveness of social mutiny.

Another, more subtle, countervailing force to the endemic plunder crisis of proto history had been the cooperative force of transcultural cross-fertilisation, possibly transforming warrior culture of conquerors by assimilating more complex associative culture of the conquered. Sophisticated handicraft, trade, civil administration, and pacifying rituals had been perforating the warrior cultures.

Class society arose and constituted itself under the pressure from labour's social mutiny against the rule of robbers. The system appeared as an historical solution

to this active or latent plunder crisis within humanity. It had been emerging as massive development features, until finally finding its self-organizing principle: ***development of productive forces through production relations*** among social classes. Put in metabolic terms, this formula corresponds to ***exploitation of nature by exploitation of human labour***.

On the one hand, progressing division of labour, increased migration, trade networks, and spreading urbanization, had been fragmenting and dissolving clans and tribes. On the other hand, the tribal systems were to be substituted by a more powerful force. The new civilized mode of cooperation was to be regulated at a more permanent footing, as well as a larger scale. It made itself binding to relatives as well as to strangers. The new order substituted private property in land and the territorial state for tribalism. These more robust, durable, and inclusive forms of association were to prove their force of social cohesion. Linear metabolism had reached ***its characteristic level in right of association*** – class society.

In this type of order, the labouring classes received limited legal protection, in return for regularly being subjected to systematic exploitation by the ruling classes. The latter now monopolized, simply by legislation, the large-scale right of association through state and property. The former looting, or tributes paid for tribal protection rackets, had been substituted by taxes and labour rents. Monotheistic hierarchies of state religion would contribute to the social cohesion of class society.

The territorial sovereignty principle of the state was to culminate in European absolute monarchies or empire-states like China. The principle of appropriating nature was to be even more enduring. Eventually the property principle would be subordinating the state principle. Through enclosure of private property by a minority, modern society was to be constituted – 'the rule of law.'

Trade had coevolved as a more civilized, secure, permanent, and self-organizing way of procurement, parallel to the proto-historic protection rackets and wars of conquest and plunder. In fact, it had had its predecessor even in the harvesting phase, as friendly exchange of gifts in building alliances, avoiding recurring wars over hunting grounds. In the emergence of linear metabolism, trade, together with the trust building practice of credit, had evolved as an organizing principle, leading towards class society. With class society established, cities as handicraft centres and trade hubs were to increasingly develop into self-organized semi-autonomy within agricultural societies, that were still dominated by inherited aristocracies and monarchies.

With urban entrepreneurial logics entering agriculture, a rapid increase in its productivity would result. This, in turn, would lead to accelerating population

growth, with surplus rural labour power migrating into the slums of growing cities. As the development of productive forces had reached a level that made large-scale industrial production possible, dissolving the monopolistic fraternities of craft guilds, class society was entering its last mode of production, the capitalist one. It was to perpetuate a revolution in productive forces, in turn needing and breeding a general surplus in material provision and in means of cooperation. Thereby new needs were to be awoken among humans at an increasing pace, and development of modern society would take off.

Definition of agricultural society's original linear metabolism should be ***exploitation of the soil through exploitation of human labour***. Emergence of this type of metabolism could be counted by thousands of years. Linear metabolism would culminate in a much more rapid tempo. It has now endured for a few hundred years, by ***geological exploitation of Planet Earth***. This fossil regime of resource extraction signified a ***culmination in exploitation of human labour*** by machinery. The industrial revolution of capitalism marks the end of the linear phase.

During this entire phase, class society had proven itself to be a superior form of association, in developing productive forces. It had brought human evolution from self-subsistent small-scale production into associated integration in the modern industrial society. Its levelling up of human association has exerted an irresistibly attractive force. In the light of the Anthropocene crisis, this phase of linear metabolism can be evaluated as a completed natural historic experience. Development of productive forces, as the general principle of exploitation, is depleted.

In the context of evaluating the general characteristics of the second metabolic phase, class society should be essentially abstracted from its different historical forms over time and geographically. Likewise, in precisely this general aspect, we should disregard the uneven combination of civilization and wars of conquest, culminating in global colonialism, despite the fact that half a thousand years of such barbaric imperialism had set the very conditions of modern bourgeois class society. Even the capitalist relation of exploitation is unnecessary to delve on, in analysing the most general social characteristics of linear metabolism.

On the one hand, these general characteristics might be socially reduced to human ***labour's capacity to produce a surplus*** of consumption articles, enough for a minority to live in material abundance. On the other hand, these general conditions might be reduced to social ***means of cooperation still remaining too underdeveloped***, to satisfy the core human need of cultivating human relations abundantly. These two opposing variables have now reached their limits. The conditions have radically changed. On the one hand, human labour has reached

capacity to produce ***generally secure material provision***, while proving material revelry for all as a devastating utopia. On the other hand, the ***means of human cooperation are becoming potentially abundant for all***. But they are still being dominated, manipulated, and castrated by the socially dominant forces now becoming purely destructive. These same interests crave the restricting and channelling of human needs, back into its secondary and more primitive form, boundlessly growing material consumption.

This same destructivity is displayed at the interface of human society and exploited nature. There, the finite limit can be reduced to the fact that the fossil regime of capitalism has gone berserk, far beyond the vital force of capitalism itself. The capitalist mode of production's dependence on maximizing extraction of fossil minerals and fuels for exponentially developing labour productivity is no longer the main driving force. Rather it has turned into primarily whipping up aggregate consumption power. This in order to supply the parasitic rent seeking of abstract capital.

By depleting minerals, together with fossil and ground water, and by indiscriminately discharging waste from large scale production and consumption, the possibility of linear metabolism is being depleted. Carbon is being instantly released, that had been sequestered from the atmosphere through photosynthesis and chemically stored in the underground by tectonic movements of the continents for hundreds of millions of years. Depletion of soil ecology accumulated over thousands of years, through deforestation and petroleum-based agriculture, adds to the critical natural conditions of the present phase transition. Consumption of and pollution from a broad variety of minerals is driving the biogeochemical system of the planet towards irreversible tipping points. The chain of human fire regimes is culminating in an unsustainable regime of fossil depletion, heating, poisoning, and disturbing the entire planet. This culmination means the end of linear metabolism. It spells the end of systematic exploitation as the human life form. Class society has reached its definitive limit.

The third phase – globally advanced circular metabolism

All scientific evidence today points towards the conclusion that we have come full spiral. Linear metabolism is causing havoc. It is threatening to deplete not only natural resilience and resources, but also the social cohesion of humanity as a self-associating species. It is risking society's relapse into disintegrating barbaric forms. This, in turn, would mean incapacitating us in front of the sixth mass extinction, becoming its helpless victim and executioner at one and the same time.

Linear and circular metabolism have become globally incompatible. Then, continuing to seek solutions ***within*** linear metabolism, only points towards catastrophe. Polarization between 'growth ideology' and the ideology of 'zero growth' is misleading, as it moves within the GDP statistics of linear metabolism. Narrowing down to this measure of consumption power, places the possible phase transition to advanced circular metabolism beyond the field of vision. Such hopelessness displays itself in two extremes. The technique fetishist tendency of 'eternal growth' proclaims the 'death of nature.' The most dogmatic and authoritarian environmental ideology proclaims humanity as a 'malign infestation.' These false extremes both point towards a catastrophic failure of the third phase transition. Beneath this unrealistic ideological polarization, lies a real social rift, where the true preconditions of solving the Anthropocene crisis are maturing.

Depletion of social cohesion and depletion of earth system's resilience are intimately linked. Mixing these two up, however, like present sustainability research routinely does, by corrupting the term 'resilience,' can only contribute to a catastrophic outcome. Resilience has been and will remain a scientifically sound ecological concept. Lending itself to, just as well, signifying the dangerous utopia that stabilizing and fortifying social *status quo* would be possible, in face of continuously accelerating global change of ecology, becomes the most treacherous kind of conceptual corruption. 'Environmental champions' smile in the spotlight, together with 'green' multibillionaires. Can you imagine something more dishonest and confusing, than selling out 'resilience' to those destroying it? The 'sustainability' establishment thereby tends to transform itself, from a part of the solution to a part of the problem. You cannot take one single step towards a solution if you start by falling flat to linear metabolism as your own horizon.

It is true that Jeff Gibbs and Michael Moore did not present any alternative in the movie *Planet of the Humans*, but they did take on the unholy alliance of the 'sustainability' establishment and the fake 'resilience' branding of abstract capital. That is why this alliance took every opportunity to shut the movie down from all channels of distribution.

The presently attained human level of social integration, which has been facilitated by globalization, is not nearly enough. Much more will be necessitated by the Anthropocene crisis. But the processes emerging within globalization form the given starting point. We have already gone far into the third phase transition. Advanced circular metabolism has become an acute necessity globally. And this is presently starting to penetrate common sense.

Human society needs to embed itself anew into global ecology and its circular metabolism. This restoration of natural metabolism cannot be done by humanity

‘returning to nature,’ however, reversing civilization’s Holocene-spanning urbanization trend. Nor can it be produced through generalizing unaltered copying of practices from earlier metabolic practices. Even less can it be achieved by disregarding the natural resilience of the earth system, bulldozing it by mindless projects of unilateral, uncontrollable, and unbounded technological mock fixes of so-called ecological engineering. On the contrary. One single social organizing principle will be needed, which is ecologically divisible into three different concrete principles and three distinct global zones, corresponding to Planet Earth’s and society’s co-evolutionary result.

Metabolic zones – Evoluzone, Holozone, and Anthropozone

Firstly: The ***preservationist principle*** is based in saving and restoring ***wildlife*** in the ***Evoluzone***. It should be organized by labour devoted to preserving biodiversity and ecology produced by pre-anthropic natural evolution, which has resisted tendencies to ecological collapse. Marginal effects by indigenous populations belong to this principle. The most important part of the planet’s biogeochemical life system might be saved, by large areas of landmass, lakes, rivers, and oceans stretching out in an associated system of preservationist nature reserves. Restoration of such ecologies should be undertaken, in dimensions found to be necessary for turning the tide of mass extinction and keeping aggregate earth system within a safe operating space. Cooperation, voluntarily integrating surviving knowledge, cooperative versatility, and nature valuation of indigenous populations, with the research field earth system science and all its subdisciplines, into one singular, common, and socially equitable association, should form the basis in a global social treaty of ***natural right*** in zone management.

Secondly: The ***conservationist principle*** should, first of all, be based in optimal restoration of Holocene’s pre-fossil ***cultural landscape*** in the ***Holozone***. But it must aim higher than that. Vast volumes of already emitted carbon must be re-sequestered. High-technological regenerative precision agriculture, together with reforestation, should focus on a recovery of soil that had been impoverished by fossil agribusiness, in the most rapid manner possible. Even larger areas of the world oceans should be covered with marine permaculture (seaweed farms), contributing to rapidly turning the oceans and the atmosphere from rising to sinking CO^2 levels. Saving and restoring biodiversity and carbon sinks, by rehabilitation of topsoil, woods and dungeons, wetlands, streams, dams, marine ecology, et cetera, becomes top priority within the rural landscapes produced by civilization during the Holocene. This principle should include conservation of culturally valuable sites, reflecting the history of human civilization, thus

including also ancient, premodern, and early modern urban areas. Equitably associated competence, between agricultural and tradition bearing rural populations and the ecosystem service of cities, for restoration of a sustainable Holozone, should found zone management's global treaty of its particular ***natural right***.

Thirdly: ***Urbanization*** should be completed in the ***Anthropozone***, as a closed system of simplified ecologies. Within this ***segregate human right*** – the ***anthropo-centric principle*** – everything will evolve around human life and human metabolism. Optimally compressed food chains (for example high-grade protein, produced by bacteria or fungi) in contained, circular, oligo-tropically optimized cultivation (few species), could exponentially raise the rate of nutritional yield to resource use. Professionally associated production, cooking, serving, and recycling of healthy, tasty, and varied food, closed flows of circulating water and materials, with construction applying urban mining design, and production organized in symbiotic industrial parks, should provide for reducing rural resource mining (agricultural produce, logging, mining minerals, et cetera) to dimensions balanced by reciprocation and restoration. Monitoring and balancing of the species gradually adapting to urbanized areas, should complete this segregate type of human ecology, proving its achieved anthropocentric form of circular metabolism by not discharging any unintended waste. Successfully providing subsistence to inhabitants, and producing surplus labour power, within this Anthropozone, becomes a direct precondition for managing to provide ecosystem service to Evoluzone and Holozone. By its hyper-productive ecological enclosure, and its global eco system service, Anthropozone can conform to planetary natural right.

Then, what happens to the human fire regimes? On the one hand, remnants of the carbon-based human fire regimes should be turned into ecosystem services, like controlled fires, optimizing the resilience of the Evoluzone and the Holozone, or production of biochar, for combined carbon sink and soil improvement, et cetera. On the other hand, the human fire regime of energy production should be decarbonised. By converting to producing, storing, and burning non-polluting fuel – hydrogen – it would contribute as one of various balance and backup methods for irregularities in flowing energy sources.

A zonal segregation of the planet will be needed, for transcending into global sustainability. It could only be achieved by entire humanity self-organizing in association, around its reintegration as advanced circular metabolism within the earth system. This prospect is based in the uneven outcome of 200,000 years of socio-natural co-evolution, proceeding through two metabolic phases. Now transition into a third phase has become the global survival issue.

The mapping of these three zones are all but random. They should depart from the actual results of socio-natural co-evolution, at the outbreak of the Anthropocene crisis. Such a human ecological and social reintegration, through territorial segregation, could therefore not be described as a matter of armchair strategy. In that respect, it must be the absolute opposite of the cartography that the colonial powers applied when they were encroaching in Africa, the Middle East, and further parts of the Global South, more than a century ago, as linear metabolism culminated. Anthropic zonal patterns, on the contrary, could become flexible and intersecting, in smaller or greater scales, based in state-of-the-art ecological science integrating in equitably associative resource control. For a number of reasons, natural as well as social ones, Africa will be able to head this human phase transition: Richest in yet untapped human force (young population, ready to study and work) and flow of natural resources; least overloaded with linear metabolic infrastructure. Strongest motive for countering the ravages of the Anthropocene crisis.

This phase transition could be described from nature to humans: Zonally separating remaining or restorable wildlife of the Evoluzone, as well as biodiversity in existing and restorable cultural landscapes of the Holozone, becomes dependent on constitutionally establishing the ***natural rights*** of these two evolutionary zones, in relation to cities and their sprawl of infrastructure. Obviously, this has become the scientific meaning of natural right. Natural right is the right of Cenozoic life, to continue its natural history of biodiversification.

It would signify transformation of urban centra, from destructive forces in exploiting Planet Earth, into an Anthropozone primarily reproducing its own autonomous conditions. In binding and unbreakable contracts and balances, it would treat the output from conservationist rural agri- and horticulture, sustainable fossil extraction, as well as exclusivities from wildlife, as the supplementary luxury of natural gifts, in return for urban surplus labour contributing to equitable social services, to technology transfer, and to ecological monitoring, research, and restoration, in the two zones of natural rights. Migration and touring between the zones should be free, within the framework that equitable resource balances permit. Only by such natural historic segregation of earth system's circular metabolism in three zones, can humanity sustainably reintegrate within nature and within itself.

The third phase transition might just as well be put the other way around, starting with humanity's need of abundant association. From such a departing point, ***co-working forces*** between human labour power and sun-powered biogeochemical work of the earth system could be developed. ***Ecosystem services*** might thus be scientifically determined as the principle of surplus human labour power devoted to ecosystem monitoring, research, maintenance, and restoration. The corrupt

meaning today put into the term ‘ecosystem service,’ will prove untenable. Capitalizing parts of ecology, for the rent seeking of financial markets, is neither service performed by eco systems, nor supplied to them. It is a destructive force. By the third phase transition, ***Anthropy*** as the human-earth system, will follow civilization.

Anthropic principle

The term ‘anthropic principle’ might probably be readily appropriated, without any semantic transfer necessitated. Presently it appears to be no more than a shaky proposal for concept of speculative cosmology. It should therefore be free for forming a scientific concept, taken down to Earth. The ***anthropic principle*** should be conceptualized, as the expression of human metabolism re-integrating within the circulating metabolism of the planetary life system, generating the third phase of socio-natural co-evolution. Through a successful third phase transition, the entire earth system becomes dependent on the path taken by human metabolism in this third phase.

Anthropocene as a new geological epoch can only be realized, by simultaneously being a phase transition in human global metabolism and in the earth system’s anthropic re-stabilization. Therefore, this anthropic principle should be conceptualized as ***associating in managing the life-sustaining interdependence of humanity and the biogeochemical earth system***. The progressive result of this self-organizing principle should be conceptualized as ***Anthropy*** – a sustainable earth system manifested, monitored, and managed through development of ***collective human intelligence***. This anthropic principle forms the ***third order approximation*** to human nature.

This time it is a phase transition that cannot take millions of years, like the first one did, nor thousands of years, as the second one did. It must be completed within decades. There are four great advantages now. ***First***, we are rapidly becoming aware of this window of opportunity and its limited dimension. ***Second***, the technological and social means of generally and sustainably satisfying basic material needs – sufficiency – are already at hand. ***Thirdly***, the means of cooperation have been approaching abundance. This makes global association possible. Humanity’s development of needs might then focus on abundantly enriching cooperative relations. This is the essential feature of the ***human condition***. It is also an unconditional requirement for succeeding in the phase transition. ***Fourthly***, the rapidity in the great acceleration of global change could be turned into a planetary asset. If humanity’s concerted effort gets self-mobilized in completing the necessary phase transition, it gets possible.

The myth of ‘circular economy’

This introduction is not the right place to positively analyse the emerging features of advanced circular metabolism, in need of rapid and united global integration and upscaling. The last book of the present work will focus that issue. Suffice it here to make one negative determination of the concept. Circular metabolism is not the same thing as ‘circular economy,’ but its opposite. ‘Circular economy’ is a corrupted concept. It is a contradiction in terms. It should not be confounded with globally advanced circular metabolism. ‘Circular economy’ is being marketed as a business model, claiming to represent sustainable economy. But it actually expresses a reactionary and artificial prolongation of linear metabolism’s commercial obstacles to circular metabolism.

We have ‘dematerialization of commodities,’ or ‘commodities turned services,’ the story goes, in narrow market analysis of the tendency represented by globally dominant IT corporations. This also, is a contradiction in terms. Already produced information, available within virtual means of cooperation, which actually can be infinitely reproduced, without any additional cost than the energy required for storage and transmission, is being locked in judicially and functionally, as ‘immaterial rights’ and ‘intellectual property.’

This has turned into an ever harsher and more destructive struggle, trying to arrest the generally accelerating historical tendency of property liquidation. Instead, progressively completing this irresistible tendency, as general ***depropriation*** (dissolution of property), will be a necessary part of globally advanced circular metabolism. Such a depropriation becomes a fundamental precondition, for liberated natural right, as well as for equitable human right of abundant association.

To the extent that such reactions get successful, in trying to commercialize the need of circular metabolism, they turn into obstacles to systematisation, upscaling, and integration of innovations in sustainability. Instead such innovations become exploited selectively, unilaterally, and unbalanced, in such a way that they force up surrounding linear metabolism even more. They get implemented, only in forms and to the extent that they prove compatible with safeguarding and strengthening abstract capital’s accelerating demands for increasing rents.

In the past few decades, the virtual means of cooperation have found their perverse business model: Giving free access to social media, in exchange for a global systematic identity theft. They go on by auctioning collected data about us to interested bidders. Through Big Data, they centralize cognitive surveillance, control, and manipulation of the users, guiding their senses towards aggravation of globally unsustainable material overconsumption.

‘Circular economy’ wants to give these same commercial interests total control over all material resources of Earth, including monopolized ownership throughout the entire consumption process. This doctrine wishes to complete ‘commodities turning into services,’ so that we consumers never would buy anything, but instead lease all that we use. Global corporations would own and mine resources, produce, rent out, take back, and recirculate all the products. We consumers are told to trust that they would be interested in using this total power sustainably. But for crass economic reasons, the real results would be aggravation of products’ planned obsolescence, deepening of the rift in wealth, powerlessness, and growing frustration of human needs. The Anthropocene crisis would move towards catastrophe, instead of getting solved.

The fact that the phase transition to globally advanced circular metabolism neither can take place at an individual, separate, or national level of resource control, but only globally, is by the proponents of ‘circular economy’ utilised for demanding globally amplified power and wealth to a few billionaires. Their conclusion becomes the opposite of globally generalized right of association, which will be needed for a real transition to advanced circular metabolism. Monopolized ‘cradle-to-grave’ resource control to this associated rent-seeking abstract capital, would mean linear metabolism being transformed into a global totalitarian vicious circle of unbounded parasitism. What a nightmare! This is the wet dream of abstract capital. A vision never to be materialized. But in a worst-case scenario, it might prove forceful enough to distract sufficiently, to result in sabotage of a successful phase transition.

Abstract capital’s self-confusing collision, collusion and delusion, is trying in vain to fumble with the necessary phase transition to globally advanced circular metabolism on its own conditions. By this brief digression, touching upon the destructive force driving and aggravating the Anthropocene crisis, we should leave that subject for now. The first book will treat that destructive force. The subject of the seventh and concluding book will be the concrete possibilities of progressively completing the phase transition out of this destructive force.

The cooperative species

The capacity of any species to adapt to its environment is the selective survival principle of life's evolution. It has been common popularly referring to it, by the phrase 'survival of the fittest.' This formula had been transferred by Herbert Spencer, from his competitive model of sociology to his essays on species evolution, parallel to Charles Darwin and Alfred Russell Wallace discovering and publishing their ground-breaking findings on natural selection. Although it was to become the slogan of 'social Darwinism,' a corruption of evolutionary science as a racist ideology of class war, it need not be useless. It all depends on the definition of 'fitness.' Defining fitness as the capacity of a species to successfully adapt to, contribute to, and benefit from its natural environment, it might serve as a useful formula of evolutionary theory, although 'natural selection' is more comprehensive. Darwin was to integrate the formula, after suggestion by Wallace.

Human adaptability was to become qualitatively different from that of all other species. Early hominins not only got genetically adapted by their uneven success in reproduction. Nor did training of kids or deviants of flocks restrict itself to socialization by conditioning, in line with dominant instincts, like many other animals did. Socialization itself started to become a process adding to itself in complexity, from one generation to another.

Groups of hominins started adapting their proper environment. They also acquired ability to change environment and discover new surroundings. By themselves altering their external environment, hominins were changing their own needs. This two-way external adaptability had become possible, due to these species' unique internal adaptability. Only by adapting to each other, that is to say by cultivating human relations, had this processing and mutual external adaptability in relation to environment become possible.

Thus, to an increasing degree these humanlike species had started to act as interlaced evolutionary organisms – a development of society. It was precisely such evolutionary understanding that had been obfuscated by social Darwinism. It had corrupted evolutionary understanding, by borrowing the biological term 'organ' and misusing it as a simple and arbitrary allegory, tossed through millions of years – 'super organism' – to designate contemporary and occasional power relations between ruling and exploited classes and among nation states.

Grounding understanding in the natural properties of the species is the scientifically sound method. Human adaptability meant that sensitivity to development of human relations was becoming the foremost natural historic

survival fitness of the species. This evolved nurturing human relations into ***the essential human need***. A unique need, separating these hominin species from all other species. The predecessors of *Homo sapiens* had thereby evolved a new selective mechanism, that could act evolutionarily. This social evolution could work incomparably more powerful and rapid than natural selection or genetic drift, which were based in such genetic mechanisms as mutations, genetic recombination, or gene change. As a matter of fact, this social evolution would, to an increasing degree, influence genetic change, to the advantage of those leading to sociability, strong ties, empathy, et cetera. In short: ***Human love*** had started evolving into the survival feature of a speciation, that was to become more successful than all the others. Genetic changes were to become subordinated to this species-specific exceptional vitality.

Concerning exactly what paths the socio-natural evolution from hominids to hominins had taken, and precisely what events had led to the survival of one single species of these hominins, is not the prime concern here. As new discoveries pop up, these lead to reinterpretations and changed hypotheses, something which happens at increasing speed. The general tendency, however, of these successive iterations, is the development of an ever-sharper picture of human nature as a cooperative species. The first order approximation to human nature is becoming an unquestionable consensus. We are, beyond doubt, the cooperative species.

One of the first manifestations of the proto-cooperative stages of hominin speciation, proving that it had reached a new type of evolutionary ranking, was most likely its beginning climbs up the food chain, from prey towards top predator. This might be assumed evolving via cooperative scavenging, with flocks of early hominins waiting their turn, until predators and canine scavengers had consumed all the flesh of a prey, then completing the business by attacking the skeletons with sharpened stones and consuming the nutritious marrow, practising a cooperativity which only these social animals had been capable of developing. Of course, emergence and development of the human fire regime was to become the greatest step up this climb. During such ecological advancement, cooperation had been firmly establishing itself as key survival feature, since life at the savanna had proven naturally harsher than the proverbial law of the jungle, the primate Eden.

If such cooperative behaviour had formed the springboard, then control of fire for hunting, protection, landscaping, and cooking had constituted a virtual leap. Much of the resulting over-nutrition had been channelled into hypertrophying the most energy-consuming organ of the body, the brain. It was the rapid evolution of this cooperative organ, which had improved the hominins' capacity for nurturing the social senses of cooperation – love, together with cumulative cultivation of complex manipulative skills and abstract knowledge. Particularly the forceful

expansion of the frontal lobe provided for abstracting the mind from immediate impressions and concentrating it selectively and persistently on more composite tasks. An almost as dramatic increase evolved in the subcortical areas, where emotions are generating. This new combined strength of sense and sensibility was – allegorically borrowing two technological terms – 'rewiring' and 'supercharging' pre-adapted potentialities for high-sociality, strong-tie, and group propensities. Such features had already been genetically present within the brain of the great apes, although not activated and selected for in the way they could now become, by this human socially evolved emotional loading.

Recent findings indicate that specific speech organs had developed already at the very dawn of *Homo sapiens*. Excavations at the coast of South Africa show remnants from a *sapiens* refuge during East African desertification, that seem to imply advancement in cultural means of communication earlier than previously thought. Such findings might suggest that dialogue and symbolic representation proved its higher collective survival probability earlier than formerly believed. Means like language and symbols should have been more efficient and less violent than mere body language, in managing this rich emotional life for the common good.

The nutritional improvement provided for by hunting, gathering, and the use of fire, had augmented physical staying power, like running endurance, which could outperform superior speed and acceleration typical of prey. Improved physical stamina could also be enough for persistently working up the material tools of cooperative activities, et cetera.

Finally, looking at reproduction, however, probably paints the sharpest relief for understanding how the evolutionary advantage had emerged and been selected for, as mental features had been prioritised by evolution for physical ones, in hominids evolving into hominins. The less wide pelvis, required for upright walk, and the bigger heads, required for a cooperative brain, had tended to collide. How would the slimmer females be able to deliver these large skulls? According to the contested 'obstetrical dilemma hypothesis,' females would have tended to die in childbirth to an increasing degree, favouring hereditary disposition towards premature birth. A contending interpretation, 'the metabolic crossover hypothesis,' has observed that there seems to be a definite biological limit in all mammals, as to how large and energy consuming a foetus might grow, before it gets hormonally rejected by the womb. Regardless, the result seems to have been delivery of an unfinished foetus, measured by animal standards. The proportionally much greater brain was, nevertheless, not fully developed at birth. The brain of the human child would nearly double during the first year. This explosive growth is nowhere near, neither the decelerating growth of most other parts of the body, nor the ceasing growth by closely related animals. Then, what

was the survival advantage of this? At first sight, evolution had seemingly burdened hominins with an initially unfit offspring?

But precisely this had shifted the focus, to how the group of hominins would be able to protect and rear the helpless kids. Already the need for assisted birth, had displayed a qualitative difference from other animals. Birthing had become a cooperative labour. And the mother of the helpless baby would be directly dependent on her human environment, to get any food. Then, the entire hominin flock was forced to focus on how to compensate for the apparent underdevelopment of the new-borns. During an intense first year, the senses of the baby were completely focused on assimilating, as efficiently as possible, to the rapidly growing brain, the cooperative advantages that had been achieved culturally thus far. What might have seemed like initial unfitness, consequently contained expanded reproduction of the very core in human survival fitness. Early infancy, corresponding to late gestation of animals, had by hominins transformed into an intensely combined biological and social development process. Thereby the notion 'extrauterine foetuses,' referring to the tiny tots that had become the common task of the entire group to culturally refine. And the flock of grown-ups needed to focus this critical bottleneck of survivability. Arguably, survival of the helpless infants had become the very ***organizing principle*** of emerging cooperativity.

It is a reasonable assumption that the matrilineal ties of kinship, which still some million years later were to remain typical of early clan structures, could be interpreted as a distant remnant of this core importance in preserving, nurturing, and educating further generations of cooperative ability. To borrow some modern terms, 'the child perspective' or 'children's rights,' seem to have been born as a natural principle out of hominids evolving into hominins. And the combined helplessness and receptiveness of the kids seems to have been a catalyst of the evolving cooperative nature of human speciation.

Cooperative dynamics

The complexities of inter-human adaptability have been the subject of innumerable interpretations, and controversies among these. In intact class society such interpretations had to be biased. The need for downplaying and explaining away obviously cooperative human nature, had been part of the ruling classes' existential conditions. This had been inevitable, especially under conditions where collectively powerful means of cooperation and methods of enquiry were still largely lacking. This does not mean, however, that basic conceptual determinations of its dynamics must be impossible to establish. Certainly not now,

as class society is rapidly depleting its potentiality, while means of cooperation grow explosively.

Experiments with animals have demonstrated limited capacity to cognitively identify with each other. One animal observing another repeatedly failing, and finally succeeding, in gaining a reward by solving a tricky task, might show instant skill in copying the successful effort. Even a limited empathic behaviour might be experimentally reproduced with animals.

The power of identifying, however, had become incomparably higher in humans. This had given it a qualitatively different character. The ability to feel what the other individual feels, and to understand what the other individual thinks, was no longer restricted to simple situations by humans. These skills had extended themselves existentially to the whole life situation and the entire life history. They even spread out into prehistory, handed over from the dead, and into the future of the still unborn. This extension of emotional and thoughtful identification nurtured species-specific patterns of human interaction – a cooperative culture.

Imitation and innovation

Being cooperative first of all meant being imitators. Any new practice, regardless of its origin by chance or by ingenuity, gained cooperative traction by a common sense of copying, approving, and memorising it. Massive adaptation by imitation formed habits, the opposite of instinctual impulses. These habits facilitated and aggregated further identification and inter-adaptability. As habits had become widespread, combined, and long lasting, they formed mental conventions and cultural traditions, in turn being institutionally fixed. Transferring as meticulously as possible such gains, by physical demonstration, oral tradition, and symbolic artefacts, had become the main thread of evolving human culture. Without such conservative features of cooperation, societies could never have formed.

The specific features of human life, however, with its rapidly changing conditions, could not allow for habits, conventions, and traditions, even remotely as a rigid as animal instincts within ecological niches. That, of course, would have meant at least stagnation, evolutionary regression, and most probably extinction. It might serve as a good hypothesis that now extinct hominin species could have suffered a somewhat higher degree than *Homo sapiens* of such stability. That might have been beneficial for a time but – as conditions changed – detrimental in the end.

Recent findings have proven climactic conditions rapidly changing in extreme fashion, in the cradling heartland of eventually successful human evolution, situated in East Africa a few hundred thousand years ago. These abrupt and dramatic changes can be assumed to have played a strong selective role in

evolutionary singling out the extreme cooperative adaptability of *Homo sapiens*. Features which later would come to general use, in adapting to the most diverse conditions around the planet. The advent of the last ice age, driving East Africa to desertification, brought regional animal life to a minor regional mass extinction. The speciation of *Homo sapiens* seems to have taken shape, passing through a critical bottleneck of near extinction. This crisis seems to have been answered by a dramatic self-organized change of environment and lifestyle to a coastal refuge in South Africa. At least contemporary state of the art suggests so. Eventually our species could live and thrive practically anywhere.

The ability to innovate, when faced with new challenges of environmental character, should therefore be included in the basic determinants of cooperative skill. The opposite of convention – fantasy – should be dubbed the midwife of innovation. As we all know, necessity is the mother of invention. Within the individual, the social feature of fantasy was represented by intuition. It was the core quality of individual intelligence, at the interface of emotions and rational thinking. The dialectics of conservative copying and intuitive innovation became a cooperative dynamic.

As we speak of innovation, we often think of an individual genius having a breakthrough. This, however, is normally a marginal phenomenon within human cooperation. It has always been. Innovations most typically take place by trial and error, as successive iterations at a mass scale, under the pressure of varying external and internal conditions. And the wider the scale of a practice or a tradition, which had been faithfully copied, the larger and richer the flowering field of such successive adaptations to various needs. No less important, it was precisely through careful mass imitation that the defectiveness of original innovations could achieve greater perfection. The fundamental form of innovation and tradition was the ***associated mass effect of a human intelligence growing increasingly collective, and by doing so gained incrementally in precision, scope, and adaptive variation***.

Innovators not only piloted new tools, new procedures, new habits, but also language as conserver of knowledge and as tool in new interpretations of reality, forming frames of reference for collective identification with the group, with the species, with society, and with Mother Nature. Which one of the two basic human languages, the numerical or the semantic one, that had pioneered evolution of symbolic abstraction, might not be that easy to find out. It was the active disapproval or approval, adoption, and perfection, however, by the mass of imitators that provided for the failure or success of any innovation.

As imitators proved to be qualified improvers, in rare cases even to a degree that an incomplete or even almost failed innovation could have its breakthrough, the

continuity and acceleration of social development would, of course, blur the lines between original innovators and improvers. The higher and more rapid the degree of development, the harder to isolate an individual genius. The more abundant the means of cooperation, the more collective the process of innovation, proving the collective nature of human intelligence.

In the present crisis conditions – the great acceleration of global change – the motive forces of social and technological innovation get ever more important, as compared to the routine conservative forces of imitation, habits, conventions, traditions, and institutions. And the potentiality of explosive mass imitation inherent to abundant means of cooperation is even more important. This state of flux corresponds to the third phase transition.

Human labour as devoted and divided cooperation

The ennobling, concentrating, and functional division of cooperation, into the status of professional human labour, became the constituting feature of human society. This pertained to the second phase of linear metabolism. As humanity transcended, from foraging to provision of material necessities through maintenance of social production, the need for permanent leadership of cooperation arose.

A primordial division of laborious tasks had already been developing during the first phase. It had been based in female reproductive labour predisposing for more permanent nourishing and nurturing skills, at the core of cooperative development. The proportionally greater muscularity by the males had been inclining to hunting and combat. This sexual division of cooperation, however, between female collectors and male hunters, did not have to take on an oppressive character, unless permanent or recurring war over hunting grounds had tended to generally weaponize social relations. In the wake of such critical conditions, the womanizing of incipient patriarchy might have resulted prematurely. For example, it is hard to imagine any other origin of female circumcision, than in an early, incomplete, and precisely therefore overly brutal assault on female autonomy, in a situation where the social conditions of patriarchy had not yet matured.

It was not until the phase transition towards linear metabolism, however, that women and children could start being systematically degraded and regularly treated like speaking cattle, similarly to the war captives domesticated as slaves. It was this process of productive achievement and social differentiation that would ultimately end up in private property and territorial state. And this, in turn, was both founded in and constitutive to the social processes by which the productive

success of the sedentary life form was to eventually evolve into private property and territorial statehood.

Early stratification of society into rigid casts, by inherited occupation and social status, bear witness of a more primitive social division of labour than through property and state, class society's more dynamic level of association. Cast divisions had still been tribally associated. Such proto-historic remnants, together with their stigmas, had probably been so deeply embedded within cooperation, because they once had been piloting social division of labour. All such things will of course vanish together with class society.

In accordance with the first functional division of cooperation by sex, growing into one that was becoming socially discriminative, predominantly male leaderships would crystallise and rise to the status of rulers. At the proto-historic pre-stages of class society, with their typical domestication of slave labour, human cooperation had been brutalised. A minority of men had conquered power, as an ***enclosed cooperation***, in a sect-like community above general cooperation. They could live relieved from toil, at the expense of human collaboration. They had thereby acquired a special interest in spreading the cooperation of the labouring population. Such ***segregated leadership versus massive incapacitation***, would remain the hallmark of human cooperation throughout civilization. This fundamental feature would constantly reproduce itself down to the micro level. It would produce hierarchies, that were not founded in selecting those most merited for tasks. Rather they would form through self-selection of those most self-interested. Their climbing up the social ladder, would form the socially fertile soil, of what was to eventually become politics.

But such association by segregation, was to be fully realized and constituted as organizing principle, only with the advent of class society. The great historical achievement of class society was that it institutionalized human labour and its division as an exploitative social relation, optimizing the development of productive forces – ***social exploitation of surrounding nature, through the leverage of exploiting human nature***. At the most general level, class society and its metabolism corresponded to ***remaining scarcity in the means of cooperation.***

Now, class society is no longer possible. And means of cooperation are becoming abundant. Massive incapacitation of human association within the earth system has become obsolete. In fact, it expresses the ***former productive forces transforming into an aggregate destructive force***. Realizing that human division of labour cannot and must not continue in oppressive and exploitative forms, should lead to the conclusion that constructively working for a global social mutiny is the path that is left, for solving the Anthropocene crisis.

Violence and right of association

Two inverse curves of human cooperation can be distinguished, throughout the entire second phase of linear metabolism, including its proto-historic phase transition. The rate of internal lethal violence has been tendentially declining. The level of association has been incrementally rising. There is a correlation. The tendentially falling human rate of internecine violence has, averagely and in the long run, corresponded inversely to the tendentially rising historical success of human association. They are not simply or mechanically connected. It has been a general civilization-spanning trend though, with these two variables intermingling and changing place in concrete passages of history.

As social systems and world orders had succeeded each other, violence had both paved the way and permeated intercourse in furthering wider association, under conditions of class society. The re-uniting of humanity's fate in capitalism's rise through colonialism is, of course, the prime example. The violent outbreak of democratic revolutions, giving birth to popular association in modern nation states, is another important one.

Today, the relation of these two inverse variables manifests itself, on the one hand, as the recent loss of state capacity, in the most developed counties, to mass mobilize for war ('the Vietnam syndrome'). On the other hand, human self-organization only continues growing and proliferating in nonstate or supranational forms. These two tendencies are characteristic of the post-war period of global change. And they have been especially typical during the last decades, of great acceleration in global change.

The relapse of nonstate military organization displays a similar tendency. Mobilization capacity has been collapsing, from former guerrilla warfare, eventually maturing as regular national armies, into sectarian violence, shrinking into armed gangs or individual terrorism. Thus, also violent mobilization capacity outside state control has been waning. The great majority of poorer populations have been busy associating, in trying to build a better future for their children, grasping opportunities provided by abstract capital's global industrial repulsion.

The two inverse trends described above can be substantiated statistically. But they appear to be contradicted, under certain circumstances, by another feature. The past decades of great acceleration have also displayed a pattern of chronic civil wars, including barbaric brutality, and even local holocausts. These features are still appearing restricted to so-called hotspots, where class society's statehood and private property has started dissolving into warring private armies, financed through plunder, seizure of resources, illicit business, and contraband. However, these features should be understood as a tendency, that threatens to spread. We could expect them as a common alternative if generalized association, in solving

the Anthropocene crisis, should not succeed. The present disintegration of class society, if not progressively solved by global social mutiny, will follow a social path of criminalization in human relations. It would spell a devastating relapse into barbarism, accentuated by the abundant means of cooperation at its armed disposal. The feature of tendential criminalization in human relations, indicative of society's presently critical state, will be treated in the concluding book of the first part.

The general tendency still prevailing, however, holds a brighter future. Human cooperation is leaving behind the violent birth pangs, characteristic of civilization's second phase of exploitative metabolism. With means of cooperation approaching abundant levels, their reach potentially spanning the globe within entire humanity, the human need of generally associating has been awoken. The still existing state of human relations is an historical result from class society, violently monopolizing natural and human resources. Now, this condition is revealing itself to threaten global mass destruction. This is what the Anthropocene crisis demonstrates. Generalized association is thereby becoming not only desirable, but outright imperative.

It is no longer an awe-inspiring monopoly of violence, that upholds the obviously destructive order. It is merely kept up, as a lingering result of a continuously existing confusion, in confronting the general dimensions and concrete tasks of completing the necessary phase transition.

The phase transition to globally advanced circular metabolism, with human labour acting in synergy with life's biogeochemical metabolism of sun-work, will at one and the same time be a natural historical realization of the self-organizing principle of the cooperative species – the ***general right of association***. The first, second, and third order approximations to ***human nature*** come to the fore.

The human senses

As cooperation became the unique survival fitness of our species, elevating it into the primal human need, the five bodily senses of humans were transformed accordingly. Tactile sense, eyesight, hearing, senses of taste and smell became socially focused. And just like material consumption had been reduced to a mere precondition for, or means to achieving the deepening human relations desired, the bodily senses were narrowing and refining to capacities for experiencing human pleasure and love.

And these socialized senses, in turn, diversified and enriched these human relations. In fact, human senses were no more developing chiefly as physical features of the individual body, but primarily as immaterial social senses within the very relations between individuals. The dialectic of inter-human adaptation was to converge these relational senses into ***common sense***, amplifying, extending, and conserving human association.

Direct sensory impressions are no longer the focus of human senses. Rather it is the sensualism of the ***human mind***, which defines the human condition. Its individual manifestation is perpetually occupied with remembering, enjoying, resting from, and preparing human relations. Being alone might be restful and re-creative, but being lonely means human suffering, so devastating that it leads to premature death. It might even turn suicidal.

The nature and frustration of human needs

In the human species, the need of developing and enriching human relations evolved into the primary need, since its fulfilment increasingly placed the species in an advantaged position within its environment. In the process, cooperation became an end in itself. It became the means of satisfying the need to realize individuality, by integrating parts of what had been achieved collectively within human cooperation. Material consumption has, to a rising degree, been reduced to a mere precondition for satisfying this basic human need of freely enhancing and enjoying human cooperation.

In class society, however, the ruling classes, effectively monopolizing the right of association through their hold on property and state, had routinely set the standard of material overconsumption and revelry. It was precisely in that way that they could satisfy their specific cultural need of solidifying a social position as collective agents of exploitation. That standard had evolved as constitutive part of their right of association. This corruption of needs, inherent to all civilization so far, and to its linear metabolic mode, of course reflects the restricted possibilities for abundant cooperation and free development of human relations. This frustration of human needs had even been characteristic of the enclosed and entrenched existence of the rulers themselves. Yes, in fact specifically typical of their condition.

Today there is an acute shortage in the level, density, scope, and above all quality of purpose in association of our cooperative species. Its achieved right of association does not at all match the escalated rate of cooperation already

achieved. Cooperation is becoming global, its means overwhelming, while the right to unite is denied its general character. The human needs aroused by the abundantly developing means of cooperation can therefore not be met. The great rift, between the overwhelming rate of cooperation reached and the insufficient right of association realized, signifies that the ***difference between human needs awaken and those satisfied is now greater than at any other point of time***, since hominins separated as a qualitatively different family of self-progression from the animal kingdom.

The failure of meeting the primary human need – uniting in abundant relations – has fuelled futile material overconsumption. Frustration of this need turns into a barbarically energetic regression, bursting forth where- and whenever it becomes immediately possible. Human needs are instant. To the human mind, material overconsumption works just like the empty calories of junk food to the body. It only triggers further hunger of frustration, while deteriorating physical and psychosocial health.

The Grand Canyon presently separating the levels, of human needs to unite that have been awaken and those satisfied, is not random in origin. And this abyss cannot be randomly abridged. It can only be done by commonly meeting the challenge of the Anthropocene crisis in union. This both requires and opens the possibility of breaking the massive social incapacitation typical of class society and its linear metabolism. The fact that its disintegrating system artificially maintains the vast majority of us in such an outdated state of powerless and irresponsible childishness, is the driver of the consumption impulse. In turn, it meets the supply from a fossil metabolic regime which is not sustainable. As private persons, we can neither fully satisfy human relations, nor consume sustainably, since the outlived system offers the exact opposite of these two kinds of needs. Only by equal and energetic engagement, in completing the phase transition to globally advanced circular metabolism, will abundant opportunities for enriching human relations open themselves.

In the absence of social mutiny, nothing else can strike roots than frustration. This present frustration of needs spans human existence from the individual level to that of humanity in its entirety. At the former level, frustrated young people are driven to treat their own bodies as objects of product development and their own social relations as market relations, with the centrally manipulated devices of social interconnectivity in their hands. At the latter level, this discord is concentrated in the still unattended need to solve the Anthropocene crisis. It is this frustration of needs, at all levels of association, that semi-helplessly boils down to the bodily and spiritually unhealthy habits, contributing to aggravating the planetary crisis.

'Artificial intelligence' or collective intelligence?

The common sense on human intelligence, still prevailing, is mechanistic. Intelligence is perceived as an individual mechanic of pattern recognition, interpretation, inference, and computation. Such understanding is a reduction, that does only partially and restrictively reflect the mental power of the cooperative species. What is measured by traditional IQ tests is not human intelligence, but at best an individually isolated, schematized and culturally biased commensuration of its formal preconditions.

Progression of human knowledge could not have been possible, in the absence of reduction to rules and systems of thinking. Mathematics is the most exact, and also the most abstract, way of conceptualizing cognizable patterns. It has led science to insights way beyond what could have been approached by pure sense perception and common sense. Formal logics is the most general way of assorting and organizing the results of accumulated empirical experience. That does not mean, however, that the process of human intelligence would be reducible to these extremely successful and indispensable conventions.

What about us humans? It is not by chance that the spot in universe where science, so far, has been failing most conspicuously, is precisely in understanding the species dominating Planet Earth. How come? Maybe a problem with a too narrow methodology? Might the research question be fundamentally flawed? Could study of this species simply be grounded by treating it, with a certain portion of ethical discretion, like a more sophisticated variety of *Drosophila melanogaster* – the fruit fly – King and Queen of biological experimentalists' laboratory tradition? Denying both the first and second order of approximation, to the object of study, is maybe not such a brilliant starting point, after all?

Intuition as the active interface of human intelligence

Approaching human intelligence from another angle, opposite of such schematic rules of human mental cooperation as touched upon above, opens a more comprehensive understanding of it. The prejudice of viewing it as possibly being purely mechanistic gets displaced. Hypothesizing intuition, as a core quality of human intelligence as individually manifested, at the critical interface of emotions and formal cognition, might prove more fruitful than simply restricting the research horizon to the fruit fly approach.

Intuitive impulses not immediately confronted with choice of action or reaction, but engaged in producing fantasy, correspond to the critical survival fitness of

innovation. Unpredictably altering the complexities of the human mind, in concordance with the ability of discovering new patterns – 'thinking outside the box' – might produce results that challenge and at best expand and enrich already established rules of pattern recognition. The same goes for ability to create original artefacts. Human intuition, the creative moment integrating human feelings and human rationality, might reveal itself as a core concept of human intelligence.

It does not necessarily represent an advance by itself. Intuition, taking the fast track to judgement, disregarding the complexities of empirically accumulated knowledge, mainly reproduces prejudice. But we should not be prejudiced, in assessing the role of prejudice. Intuition, as immediate emotional reaction, plays an important part in maintaining already established conventions, forming the common sense, and institutionalizing forms of cooperation expressing the historically achieved level in right of association. Only when activated through reactionary organizing discipline, mobilizing against threatening emergence of historically new and more advanced ways of associating, prejudice might become really nasty.

Intuition inspired, however, by longing to break suffocating conventions or unbearable conditions in human relations, might produce useful and successful innovation. As can be seen, intuition plays a central part in both upholding the conservative quality of imitating and repeating, perpetuating cooperativity, and in breaking new paths by innovation, developing cooperativity. The common denominator is the emotional loading, initiating intuition. This emotional loading is the accumulated result within the individual of cooperative experiences.

Human emotions are bred out of love for cooperation. Human memories are re-formed, and held selectively latent, by their relative affective loading in the brain, and in the rest of the body. Memories give echo, from the experiences in which they were once based, jumbled up with other experiences. Creative thinking is heavily dependent on the emotional life being formed within the social senses of human relations, and thereafter accumulated within the individual.

Modern brain research includes findings that support the importance of emotional energy in human intelligence. For example, the increased synapse firing in definite patterns characteristic of 'aha reactions,' starting out pre-consciously up to two seconds before cognitively conscious completion. This signifies an extraordinary latency of conscious arrival, when compared to physical neurological speed, and even compared to routine cognition, being processed at a fraction of a second. This might be interpreted as cognitive innovations originating in emotionally induced and regulated outbursts. These seem to break

through former cooperativity routines, which may have materialized all the way from one's own prejudices and habits to society's norms and institutions.

Another example: A significant correlation has been observed between capacity for lucid dreaming (a semi-conscious state, providing for conscious self-direction of dreams) and for divergent thinking ('thinking outside the box') as well as for convergent thinking (associating separate things). These things taken together seem to imply creative ability of forming unconventional pattern recognition. Such findings might be interpreted as emotionally creative guidance of thoughts.

Further: A mental state of actively resting the mind, by for example light cognitional loading from semi-autonomously concentrating on a well-known task, has been found strongly correlated to the brain's activation of its 'default mode network.' This pattern of brain activity has been observed in reactions like opioid-dopamine interaction, et cetera. These seem to be conductive to states of meditation, of 'wandering thoughts' and affectionate reflexions, or of intensely engaged creative flow of thoughts on complex subjects. In the case of specialised athletics, sensuous focus, physical strain, and highly finetuned motor activity all coincide in such 'flow.' And as massive evidence has shown that physical activity is interlinked to mental activity, the human state referred to by the term 'flow' should not be seen as two different kinds. They should rather be regarded as two interrelated aspects or expressions of human intelligence. In sum, the brain states which have been described as 'flow' testify to the importance of emotions in enhancing both intellectual and practical skills.

Observations of this kind seem to support the conclusion that human emotions are just as essential to intelligence, as the social systematization of formal thinking is. In fact, emotions seem to work *à priori*, as the pro-active moment in display of individual intelligence, while logical analysis seems to play the part of individual, and potentially collective, reconstruction after the event. The formal side of intelligence, so to speak, 'harvests' emotional 'yield' from what had been 'sown' within human cooperative experiences. Emotions also seem to work *á posteriori*, in selecting what memories to keep, how to associate them, modify them, and to what degree of latency to hold them. The emancipated territory of emotions – dreaming – probably plays a leading part in such arrangement.

The fact that individual emotional life originates in human cooperation hardly needs restating here. And humans have been genetically adapted and socially predisposed to a rising degree, for feeding into its dynamic. Empathic behaviour activates the reward system in the brain of its agent, releasing a sense of pleasure. Creating and expanding human association is intelligent, whether in direct interaction or individually and indirectly, creating promoting artefacts. This ***is*** the very process of intelligence, and it feels nice in the body. And this insight works

within the individual with the power of combined neurological reflex patterns – intuitively.

Summing up: Human intelligence is ***collective by nature***. It is a process, individually perpetuating cooperative results, through ***thinking and emotions in interaction***, in a dialectic ***corresponding to the level of historically achieved right of association***. That must be considered the ***first and second order of approximation*** in understanding it, in concordance with what was initially stated as to human nature.

Now, how does this relate to the conventional wisdom of cutting-edge science? To put it succinctly: Humanity is presently presented with a real and collective intelligence test – maturely pondering the challenges of the Anthropocene crisis and how to meet them. And that test is, not least, applicable to the engineers and 'futurologist' prophets of 'artificial intelligence.' How do they feel about that?

The myth of 'artificial intelligence'

The way of understanding human intelligence sketched above, is inseparable from the organic human body and its place within society. It cannot be separated from human capacity of cooperating. It is the very process of collectively cultivating, associating, and reproducing experiences from cooperation intelligibly, and of individually accumulating these results emotionally.

Such understanding is incompatible with the hyped-up mechanistic thesis of 'artificial intelligence.' As will be demonstrated, 'artificial intelligence' is a not only conceptually corrupted – a contradiction in terms by ontologically senseless reduction – but even expresses a social corruption.

The 'AI' thesis speaks of an approaching 'singularity.' It projects an evolutionary 'Big Bang,' in which associated supercomputers are claimed to overtake, overrule, and overrun human intelligence. It suggests that human intelligence would be incapacitated from understanding the meaning and implications of autonomous computerized automation. We are told that networked computers will self-organize their own datamining, machine-learning, reprogramming, design of hardware, and automated mass production of their own kind. The result – 'singularity' – the story goes, would be humanity suffering the automated production processes decided upon, designed, and dominantly implemented by such 'autonomous' computerization. It would either end up in computer tyranny extinguishing humanity, or in computer power rather choosing to create 'trans-humans,' a techno-biological hybrid species, such prognoses pretend. Computerized Holocaust befalling entire humanity, or a computerized paradise of eternal life. So, the quarrelling stories go. In the fan vision, computers would

gradually phase out inferior human components. ‘Trans-humanists’ paint a scenario, where computers replace ageing limbs and organs with mechanical or laboratory cultured spare parts. Eventually, even the ageing brain would be replaced by a computer. Its hard disk would download the life memory of the individual, together with prefabricated additional skills of ‘super-intelligence.’ The result would be individual immortality, and universally self-evolving intelligence, as computer-manufactured ‘trans-humans.’

Such technocratic fantasies are invariably distinguished by totally abstracting from, or at least primitively neglecting, the social relations and interests involved in designing the hard- and software, its infrastructure and implementation. A critical analysis of the role ‘AI’ plays in everyday life today, remains conspicuous by its absence among those enthusiasts. Oddly enough, the same goes for those who ring the alarm bell. Instead they attack a strawman of future computers. Both sides believe in the saga of living computers.

These ‘sci-fi’ versions of artificial eternal life are a denial of life itself. In short, in all their sophisticated skills at interpreting, formalizing, manipulating, and mechanizing information, they prove to be weirdly uninformed - rather displaying human idiocy than artificial intelligence.

Can there be such a thing as ‘artificial intelligence’ or not? Given the exacting and complicated challenges within the young and rapidly developing field of modern brain research, on the one hand, and the exponential growth within the technology that has been labelled ‘AI’ on the other, maybe this conflict line should be regarded an open question? Not at all! The clash of the organic understanding of human intelligence, as a profoundly cooperative quality, and the mechanistic myth of ‘artificial intelligence,’ is a virtual war front of the Anthropocene crisis. An insight is emerging, of a completed human collective intelligence as necessary for solving the Anthropocene crisis. This, in turn, must be heavily dependent on adequately designed and implemented information technology. And that points to the vital need of abundantly free development and transparency of these material and immaterial means of cooperation.

Artificial Madness

Covert, automated, and centralized behavioural surveillance. Cognitive remote control and manipulation. That is how ‘artificial intelligence’ is used today. Interactive means of cooperation are persistently forced into serving such destructive ends. This aggravates incapacitation of mass users, instead of breaking it up. Consequently, the possible evolution of collective intelligence is sabotaged.

Some large-scale active social interests, forming and exploiting so-called artificial intelligence, might be listed: Intelligence agencies, repressive organs, remote-controlled and automated war machines, globally organized commercial interests, financial markets, political factories of disinformation, internationally organized crime, and terrorism. There is today no such thing as a clear dichotomy between an 'open Internet' and a 'dark web.' It has all been jumbled up into fifty shades of grey.

The synthesis of clandestinely monopolized Big Data storage ('intellectual property,' and 'state security,'), data mining and machine learning – incorrectly labelled artificial intelligence – are skewed towards serving a disparate plethora of social interests with a destructive character as common denominator. It is tightening cognitive control, stealing, aggregating, and manipulating individual identities. The combined effect, of these high-handed kinds of systematic data breaches, produces a paralysing mass invasion of these powerful and abundant cooperative means.

State surveillance, state disinformation and repression of free thought, detailed political censorship, and push-feeding of doctored information, is one of its forms. Another form is the IT giants' collection of data and mapping of every connected individual, instantly used to design what information should reach whom, to guide exactly that person's senses towards strengthening and precision targeting already ingrained consumption patterns. China is the most advanced example so far, of how these destructive forces have allied in a suffocating manner. The interest of whipping up even more unsustainable levels of standardized mass consumption, in the thoughtless, emotionless, and mindless interest of rent seeking abstract capital, gets married to the totalitarian state's control requirements. Internationally organized crime's data mining, for large-scale fraud, management of global smuggling, and money-laundering, is an extremely profitable form of rent seeking, seamlessly melting into the financial markets of abstract capital. National influence operations and IT sabotage in targeted countries, utilise the same virtual underground. High-tech warfare tends towards drone terrorism, hunting IT harnessed terrorists sects. In cyber warfare, terrorisms clash. All this taken together acts as a compound destructive force.

The world is on the verge of rolling out the 5G net, where our entire environment, at home, at work, at school, and in public places, is designed for centrally surveying all and everything. China is spearheading. The Communist leadership develops 'Internet security' for global export. The Russian state follows a more defensive track, by entrenching and enclosing 'Putin's Internet' (temporarily pushing the pause button due to the Corona crisis). A host of authoritarian regimes are tampering with this weapon against their citizens, and Peking is throwing these states surveillance technique version 1.0 free of charge as a bonus, as they import

other commodities. The US of Trump makes an assault upon China and Huawei, since the crisis ridden American state apparatus is losing ground within surveillance industry.

The frustrated mass users, desperately longing for meaningful contact which each other, keep overreacting by individualistic exhibitionism, increasingly treating their own bodies as products to modify, their own lives as commodities to market, and their own feelings as space signals. All this is transformed into aimlessly contributing to the monstrous amassing and locking in of Big Brother Big Data. To paraphrase the old IT saying – 'garbage in, garbage out' – by inverting it, the present centralized misuse of computerization might read 'monstrosities out, monstrosities in.'

Mass reactions, against these virtual occupation forces in means of cooperation, include spreading conspiracy theories, boundlessly exploding local legends, epidemics of science denial, and of xenophobic chain reactions, the lure of instant wealth by acting as useful idiot ('Internet influencer') munching crumbs from globalized rent seeking, et cetera. Such erratic reactions are helplessly contributing to the perversion of these potential means of developing collective intelligence.

Just like in overall moralist propaganda, the mass consumers are blamed. They are charged with creating 'filter bubbles,' by embracing prejudice. This is utterly false. The destructive forces operating social media signify a permanent, 'soft,' and large-scale industry of identity theft. These virtual occupation forces are the fabricators of filter bubbles. The detailed mapping, profiling, and algorithmic cognitive control of the individual, forms the axis in this abuse of possibly developing collective human intelligence, needed for solving the Anthropocene crisis.

The real problem, hardly ever discussed consistently, as it comes to so-called AI, is not that of a future 'singularity,' where computers are claimed to form a new mechanical super-species of boundlessly progressing intelligence. The real issue is how the interactivity of global computerization is being increasingly monopolized, standardized, and centrally manipulated, for mesmerising the mass users in line with socially and naturally destructive and unsustainable interests. Such short-sighted narrowing down, one-sidedness and mass destruction, of the networks' potentially boundless interactivity around vital issues, should be disclosed for what it is. Designing, programming, and abusing information technology to such ends, as well as complying with these practices, should be the true definition of 'AM' – 'Artificial Madness.' When put in relation to what the Anthropocene crisis demands, it is pure perversion. Solving the crisis demands transparency and equal informational rights.

Fake opposition

The response of the United Nations, Amnesty International and others has been insufficient and misleading. They sound the alarm that personal privacy is under attack. That is implying that human rights could be restricted to an individual matter. In consequence, they call on states to censor the Internet, in allegedly protecting the privacy of their citizens. Thereby they contribute to legitimising the global tendency of authoritarian clampdown on freedom of expression.

Crying for state intervention of the Internet is just as counterproductive as appealing to Google, Facebook, Amazon, Alibaba, Tencent, et cetera, to phase out the mass surveillance constituting their very business model, which has made them globally wealthiest. States demanding that these corporations develop staffs of political censorship, contributes to the totalitarian tendency. Such requirements are already put into practice globally. Libertarian dopes, idolizing the freedom of destructive forces at the 'dark web,' points in the same direction.

The UN and Amnesty do not dare to speak out. They dare not appeal to the only force capable of doing anything against the totalitarian tendency: The self-organized revolt of the associated mass users.

Liberating the means of collective intelligence

Conquering means of equally interactive power, is nothing that can be approached as an isolated issue, apart from social mutiny against the very socially destructive forces now abusing them. The populations of Hong Kong and Taiwan are guiding the way. The more Xi Jinping manages to spread the tentacles of Chinese dictatorship abroad, the more numerous we become as interested parties in the coming Chinese social mutiny, the given starting point of global social mutiny.

The surging Chinese debt burden will collapse, and with it the permanent growth of mass consumption. That is when the real needs and attitudes of the Chinese population will come forward. As the young and rapidly growing Chinese working class, with its tightknit family ties to the Chinese countryside, and its overwhelming specific gravity within world labour, finally straightens its back, the real world One Belt, One Road will reach out to the world.

This does not mean, however, that those working within IT, either as developers or advanced users, can afford to waste one single day, in preparing the phase transition. That applied science, which earnestly struggles for sustainable ends, should unite in purposeful discussions of the problem as a whole.

Since a decade, the US government and infrastructural tech giants have been working on an entirely new Internet architecture (Named Data Network – NDN). It is not intended to base itself on users, but on the centrally programmed messages among devices. It is designed for 'Internet of Things.' The automated tech gadgets we are supposed to surround ourself with, communicate through, travel in, et cetera, will be able to contact each other seamlessly. IT corporations, automatically charging aggregate fees, will be able to send as well as collect all data on how we should live, through messaging the dense network of things surveying and guiding our lives. We are supposed to desire living embedded in their 'artificial intelligence.'

The Chinese state and IT giants have rather put forward a new Internet protocol (New IP). They are now trying to force this through as an international standard, through the UN agency International Telecommunication Union. By mandatorily connecting IP addresses to face recognition, the default mode of the system will be able to put individuals into disconnected 'digital house arrest,' as soon as they express themselves critically enough. New IP is planned for start already in 2021. Of course, the Russian state leadership is sympathetically inclined. Other state leaderships, being especially scared of human self-organization, while lacking technical competence and economic muscle, will be attracted.

Such plans are of course incompatible with equitable interactivity. In addition, they are at work upon splitting humanity into gigantic and separate 'filter bubbles.' The so-called Tech Cold War is a battle among destructive forces. The true response should adopt humanity's self-organized transparency as point of departure. What does this mean with respect to technology? Technological development might definitely be used and modified, if only opening and decentralizing it. Will it be enough with a new Internet protocol? Or will a new Internet architecture be needed? Let us call the fundamental principle ***common collective communication*** (***ccc***).

A list of minimum requirements in functionality should include: Open source code, free access, and block chain technology with public ledger, not based in encryption of abstract information, but rather founded in sustainable resource use and resource contribution of real people. That should mean that smart contract- and DAO-technology (decentralized autonomous organization) would be useful. Transparency would be particularly important to build into the architecture: Publicly accountable search engines, blocks to covert data mining, and mandatory transparent entry as to all public utilities and concerns – that is to say, everything concerning use and contribution of resources.

Quantitative recording and accounting of the equitable share of resource utilisation, permitted by the planetary life system and human streamlining of

resource use, should suffice. Self-organized and globally equitable surveillance and management of resources can only take place through a globally virtual currency, applicable to all levels, from the individual person or association to humanity in its entirety. Let us call it 'Humus,' alluding to both the human being and the soil. It should be ***de-propriated*** – not for owning, but for using. It should be ***noncash*** – not for buying and selling, but for recording sustainable balances. It should be ***non-convertible*** – not for exploitation and enrichment, but for balanced rebuilding of society, restoring the integrity of the earth system. In short, it cannot be constructed and grow as exchangeable within existing currency system, as crypto currencies have done, without getting corrupted and become part of destructivity. As a sovereign vehicle of the third phase transition, and its social mutiny, it would be ***non-fungible***. No encryption would be needed to define a 'Humus,' if it would be allowed to reflect the dynamic life spanning balance of resource consumption and contribution from a human being, adjusted for variable ability and need. By ***crediting*** resource contribution and resource consumption compatible with circular metabolism, and ***debiting*** those incompatible, incentives might be created to accelerate metabolic transition at all levels of society.

No centralized surveillance and data collection on people's lives needs to be included in such a system. The survey and control function of Internet should be redirected towards the very earth system. The resilience, from specific ecologies to the overall life system of Planet Earth, is what needs to be surveyed, in order to guide humanity's metabolic phase transition. Preserved and reinforced biodiversity becomes the given measure. There is a potentiality inherent to the virtual means of cooperation, of serving the ***human right of association*** in solving the Anthropocene crisis – ***planetary natural right***. That would signify realizing the ***third order approximation*** to human nature.

Super computerization

As of computing capacity, from individual variables to complex systems, computer power has long since surpassed what humans might accomplish, individually or in teams. Now, even human capacity of discovering new patterns has been outdone. It has already become unknowable to us humans, through exactly what mathematical sets, computer power in adaptive machine learning can produce data quantities, which in aggregate indicate unconventional results.

Especially 'deep learning of multi-layered neural networks,' designed to mimic measured patterns of the human brain, are starting to surpass the former limits. It will no longer be necessary to successively approach computed results, through repetitively iterating all possible calculations, and exclude all those inferior in meeting stipulated conditions. At the same time, more precise techniques of

scanning become better at simulating pattern recognition of human senses. Such advances are moving into a technological territory, where it is a not only the speed, succession, and quantity of calculations that are becoming inconceivable, even to the creators of hard and software, as well as to human mathematical cutting-edge. Even the complexity of computation, and its associative paths, tend to move beyond the comprehensible.

Quantum computers, getting incomparably faster and more versatile in their programming logics, are on the verge of breakthrough. And computers will be possible to construct in biological tissue, instead of dead matter. All this, however, does not mean that computer power will become 'artificial intelligence.' That notion is and remains a contradiction in terms. Present development, however, lives up to the name ***super computerization***.

Super computers beating world champions in chess, Jeopardy, and alpha go, or passing the Turing test, have already spread this insight to popular culture. These facts make it even more imperative not to design and program such technological power for purposes of mass destruction. Neither physical mass destruction (automated war machines under automated command chains), nor mental mass destruction (centralized cognitive mass surveillance and manipulation for unsustainable social interests).

Only their consequent design, programming, and implementation in solving the Anthropocene crisis can avoid the global 'Frankenstein moment,' intuitively approached as a coming 'singularity.' If destructivity should be allowed to go on unabated, it would not signify living computers, but a destructive point of no return within living human society. It would ultimately destroy its existence, together with the evolutionary result of the Cenozoic era. Disciplining global information technology to preservation of the evolutionary result in Planet Earth's life system in general, and to the generalized association of humanity as its independent variable in particular, can be the only meaningful definition of contemporary human intelligence. It would express the ***anthropic principle*** as ***collective intelligence in the earth system***.

Perspectives and prospects

Of course, such a principle would not exclude further exploration at a larger scale than the planetary one. On the contrary. To name only a few of the most obvious reasons for space exploration, they include cleaning up the space scrap from earlier launchings orbiting our planet. It is threatening the infrastructure of global interconnectivity, if not dealt with. Space travel, social media, and monitoring of the earth system would be jeopardised.

Another example would be preparing for defending the planet against the next catastrophic meteor impact, whether of such globally natural historic repercussions as the one that is accounted for wiping out the dinosaurs 66 million years ago, or of a lesser scale more regularly occurring. Harvesting stratospheric sunlight, magnetospheric sun wind, or meteoritic minerals, et cetera, might become future technologies.

Of course, exploration of space for testing the accuracy of cosmological theorizing should be included, as well as the accelerating quest for habitable planets and other possible life forms in the universe. If successful, the motivation for the latter should not be finding places to escape to, after humanity destroying Planet Earth, like the defeatists of the destructive forces preach. But it might fundamentally enhance and enrich our understanding and adoration of the real world.

The primitivity of the 'AI' myth might be suggested by an historical allegory. Just marvel at some intriguing post-Enlightenment discoveries, to understand why the mechanistic worldview of that time seems ludicrous today. Ponder nineteenth century introduction of iterative stochastics, in the statistical interpretation of thermodynamics, or the uncertainty principle, quantum entanglement, and other conundrums of quantum mechanics. Consider the collapse of the early twentieth century program of creating a positively closed system of mathematics and human logics – disintegration of the 'Vienna Circle,' or Gödel's further refutation of mathematics possibly becoming a coherent, complete, and closed system. Contemplate successive approximation, by permanent and parallel remodelling in interpreting the behaviour of complex systems. We might then laugh at Enlightenment's mechanistic understanding of the world's natural history, as a 'clockwork universe.'

But what about the present mechanistic foolishness, in interpreting the human mind and intelligence as a kind of isolated biological quantum computer. Paradoxically enough, in such a view, it seems to become ever more anachronistically slow by comparison. That is by completely disregarding the cooperative nature of our species. IT 'futurologists,' preaching AI, are the alchemists of our time. Future generations will discuss which one was the most adequate expression of such artificial madness – its naïve conceptualization of intelligence, or its practical application by destructively unsustainable utilisation, in the early stages of globally interconnected information technology.

Collective intelligence

What primarily distinguishes human intelligence from that of animals is its increasingly collective nature. This had been manifesting itself to a rising degree, both in physical evolution of the human body and throughout the evolution of social history. By humans, intelligence is not largely restricted to genetically predisposed and ecologically framed behaviour. It is a socio-cultural process. Only today, however, with the advent of the Anthropocene crisis, the collective nature of human intelligence becomes completely obvious. Entire humanity gets interconnected, simultaneously with humanity discovering its own natural historical impact. Thereby, the question is raised, whether humanity can change the nature of this impact. Human intelligence now reveals itself as ***collective self-reflection***.

Intelligence and power

As it comes to development of human knowledge, its collective nature had been accelerating during the present phase transition. The means of cooperation, necessary for this, had been piloted a century ago. The need for associated intelligence had been pressing increasingly. Let us first take a brief look at how this pressure had worked upon the rulers.

On the one hand, human cooperation had started to outgrow the nation state, as development form of association. This had been provoking the states to develop intelligence agencies and alliance diplomacy, as their backbones in controlling their own chronic crisis. As the world wars broke out, tossing nations into opposite belligerent blocks, coordinating intelligence in global logistics would prove crucial. Actual combat force was to represent the tip, the relative power of which depended on sub-surface icebergs of global material coordination.

On the other hand, similar features had been no less prominent in the civil society of peacetime economics. The pressure towards collective intelligence had resulted from the complex challenges of integrated production blocks and their infrastructure. More decisive, in an immediate sense, had been the comparative rewards of more likely commercial success to monopolized corporations, from collectivizing innovative efforts. One of the more striking signs, that society had started requiring a qualitatively higher level of association than private capitalism, already by the beginning of the twentieth century, was the individual entrepreneurial inventors being replaced by extensive research labs.

During the Cold War, under the temporary global restoration of disintegrating class society, this tendency would become even sharper. State power and industry would lay their heads together. How and why did Pentagon manage to gain the

upper hand? Simply put, exactly through not encapsulating the arms race in enclosed secret cities, like the Soviets had done, but instead forcing competing technology contractors to synergize their innovative efforts. Pentagon had conditioned them to collectivizing self-organization: open computer source code, mandatory information-sharing, contract-sharing, slackening of patents rights, et cetera. Precisely this opening would spur the freedom-yearning post-war generation of students, pouring into the tech corporations, to the aggregate development that was to result in Silicon Valley, the Internet and global social media.

Intelligence and common sense

If we fix our eyes more broadly and basically, the picture of self-collectivising intelligence gets even more massive. Whether we focus the social mutinies changing the course of twentieth century history, or how everyday life has been developing within working populations, we see the great mass of interactivity that has set the limits, the direction, and the standard of what orientation cooperation has been able to develop during the third phase transition.

Breakthrough of trade unions had given wage labour opportunity to speak with a common voice of united interest. The labour movement of Europe had pioneered political mass parties. Peasant populism and black civil rights movement of the US had headed a corresponding associationist tendency. The political mass movements of the colonies had raised the demand for national independence. Everywhere, struggle to conquer and define citizens' rights had searched for a common horizon.

It had not been diplomats, heads of government, or general staffs, that had ended the First World War. It had been military mutiny of millions of peasants and workers in uniform, that had laid their heads together. The collective intelligence of the labouring population had not had civil war in mind, as millions of armed men returned from the fronts, but rather social mutiny. In 1917, Russian peasants had left the trenches, returned home to the villages and self-organized the world's largest agricultural reform. The Russian workers had prepared taking over industry, through forming factory committees. The war had been halted, as Germany followed suit. The German works councils had formed an even more persistent movement, to associate 'the manual and intellectual workers.'

After these social mutinies had self-organized universal and equal suffrage within their political councils, the resistance of conservative politics to parliamentary universal and equal suffrage had collapsed like a house of cards. After factory committees and works councils had implemented the eight-hour day, resistance

to this social reform had collapsed. Twentieth century general standard for the industrialized countries was being set: ‘Recognize our Civil Rights, or we will self-organize them! Reform social conditions, or we will do so ourselves!’

Paradoxically enough, the general democratic breakthrough had thus come, in the industrialized part of the world, precisely at the moment when the fundamental condition of democracy – the sovereign nation state – had become historically outmoded. This would be even more true in the post-war period, as the colonial people conquered national independence, without ever being able to effectively exercise it.

In other words, the limits to common sense had so far proven to run along those of citizenship. To complete the phase transition, save the planetary life system, and further development of society, something more than common sense is required. Humanity’s collective self-reflection is needed. The means are there. The goal is given. Collective consciousness has not yet reached a critical mass.

Intelligence and research

Now, let us focus science. Today global networks of scientists work so interlacing that each field of enquiry tends to unite into a common global entity. In a few decades, nominations for individual scientific Nobel laureates would probably become virtually impossible. The only obvious social impediments to development of collective intelligence, internal to the research community, seem to be political corruption of social sciences, and the locking in of new scientific knowledge, according to commercial interest, state security, or academic rivalry. However, such barriers cannot be fully broken through, unless science and everyday life unites in self-organized social mutiny for constructive ends.

Earth system science is becoming the organizing principle, of the tendency towards completing collective intelligence. In the integrated research programme, occasioned by the Anthropocene crisis, there is no longer room for the natural scientist as technocrat. Clinging to stereotypes of cynically ‘objectivist’ detachment, no longer creates consensus. This does not only mean that applied science is compelled to consider its own place, within society and natural history. It even makes the dualist worldview of Enlightenment shatter, as no longer useful in approaching nature.

Although careers paths are still dominated by the destructive forces holding the largest funds, scientific endeavour is no longer gaining professional prestige by serving such interests. Confronted with the vested interests’ science denial, cutting of funds, breaking of deals, and well-funded disinformation, the scientific community is being forced to step up as passionate activists of transparent

intelligence collected. Human emotions take their rightful place, in this burgeoning formation of collective intelligence.

Still, however, its progress is severely crippled by the low standard, high fragmentation, and tendency to scientific corruptions of those disciplines concerned with the independent variable of the Anthropocene crisis – the sciences on humanity. This lagging is causing the very nexus of intelligence integration to remain a virtual void.

Sign of times

To the lay man, the striking results from experiments in the 'wisdom of crowds,' may serve as a suggestive example of collective intelligence. To stop at that spectacular level, however, does not tell very much of the degree of necessity, or the already prepared potentiality, inherent to the Anthropocene crisis. The apparent magics of such experiments merely illustrates that spontaneously decentralized synchronization may occur at all ontological levels, including the complex human one.

A little more is demonstrated by the exponential growth of self-organized and unevenly qualified Wikipedia. Its transparent real time updating rapidly dwarfs all other encyclopaedias. Its proper fringe roots in libertarian ideology, still affect its uneven turnout. Likewise, its existence within the general data corruption of the Internet. As a social experiment, however, under the presently untenable Internet architecture, it will go to history as pioneering.

To sum it up, human intelligence is organic by nature. It harnesses and augments the advanced biology of the human brain, as a centre of bodily senses. These have been transformed by cooperation, extending into relational common sense. Thus, the self-unifying artefact of human mind has been created. Human consciousness is raising its degree of collectivism, in tandem with the historically achieved social rate of cooperation. It consolidates itself at the level of association, that this cooperativity has managed to self-organize. This tendency, of collectivizing human intelligence, intensifies particularly in relation to the socio-natural challenges, now discovered by it and confronting it. And the necessary means, of realizing this tendency, are already developing at an accelerating speed.

An alleged mechanical species of computers cannot become intelligent. Allowing for the invention of bio-quantum computers, cracking, encoding, decoding, and processing mathematical operations, inaccessible to the human mind, such machines will never equal human intelligence, its collective nature, and its intuitive core. Human intelligence has evolved as combined result of natural

selection and the collective quality of cooperation. It should be respected and revered as such, just as much as Cenozoic biodiversity should.

The more autonomous an advanced computerization might be designed to operate, the more it would produce the exact opposite of organic intelligence – mechanic madness.

On the contrary, subjecting it to measuring, reporting, and fine-tuning advanced circular metabolism of global ecology, ranging from wildlife to human urbanism, might transform it to a tool of powerfully enhancing collective intelligence in managing the earth system.

High-tech compensating for damaged senses and functionalities of the human body, or enhancing those naturally given, is a reality already underway. Disciplining it to Earth's life system itself, should be a proof of humanity successfully achieving collective intelligence – ***Anthropy***.

Today, the hype around 'AI' mostly serves as a techno-fetish cover up for the destructive and minoritarian social interests presently controlling, surveying, and manipulating information technology. Their narrowly throttled abuses of it, to unsustainably destructive ends, are not intelligent. They are effectively sabotaging the means of cooperation, necessary for collectivising intelligence in solving the Anthropocene crisis.

Ontological demarcations

The general things so far stated, should be regarded as fully accountable. The same goes for what is claimed under the subheadings “Integrating science – integrating society,” “Social conceptualization,” and “The meaning of life,” below in this introduction.

Determination of human nature as cooperative, should be accepted as general first order approximation within social sciences. It should no longer be possible to object to a description of successive self-organization, as a levelling up of humanity’s association. That should be adopted as second order approximation. The possible advanced reintegration of humanity in the earth system is the problem on everybody’s lips, among those treating the Anthropocene crisis seriously. Neither this approximation of the third order to human nature should be possible to dismiss. These three approximations should be fully possible to use for humanity as independent variable, in transcending into an anthropically dependent earth system.

What is said below, however, concerning problems of ontological demarcation, impeding inter-scientific integration, must be taken with more than one grain of salt. Even the section “Some problems of integrating science,” towards the end of this introduction, should be taken with a similar reservation. We really lack the resources and competence for seriously treating these crucial subjects, in some specific ways touched upon under the rest of this subheading, and the one on scientific integration. But such an approach cannot be avoided. The extremely dangerous urban myth of ‘artificial intelligence’ seems to be commonly embraced, within the very social circles occupied with developing the leading-edge technology denominated as AI. This understanding must be fundamentally challenged. It is misleading. It is serving destructive forces. And it is paralysing.

Exactly such technology will be critical, for realizing the globally collective human intelligence needed to solve the Anthropocene crisis. But so-called AI had been originally developed for weapons of mass destruction. It has been perpetuated in destructive capital abstraction. And it is today invading human mass communication, as a cognitive zombie of class society’s undead social relations. These means of cooperation have been distorted into destructive forces.

Precisely for that reason, this introduction needs to venture into the shaky ground of ontological reasoning, epistemological problematization, and some interdisciplinary cross references. The intentions are good, even if the at times sharp tone might give another impression. Hopefully not too much embarrassing

misconceptions will be produced. And hopefully some questions raised will prove relevant.

The human mind

Describing the problem of integrated science, might proceed from its critical interface, the science of the human mind. Neurological science gets better every day at measuring, describing, and interpreting its physical, chemical, and biological manifestations within the individual human brain, as well as correlating these observations to input stimuli and output behaviour.

Social science, however, is severely lagging, by its incapacity for comprehensively describing and interpreting the processing nature of the human survival fitness – cooperation. Therefore, the question of the human mind can – and must – remain suspended in an antiquated space, between metaphysical science and metaphysical philosophy.

Natural science, meanwhile, seems happy with restricting its research horizon, to treating the individual human brain as a substrate for experimentation. This tendency extends itself, to the extreme extent that information technology and human epistemology may be jumbled up into one complete mess. By such procedure, the independent variable in solving the Anthropocene crisis – completing the collectivisation of human intelligence – remains an unexplored region.

By stubbornly restricting its search for a human mind, to its individual biological manifestation, an individual and isolated human brain, the ‘AI’ myth is granted safe conduct. And natural science on human consciousness gets stuck in a ‘flogiston’-like trap, where otherwise highly qualified individual scientists might be enticed into dematerialized philosophical speculation now and again. Maybe we should resume the quest for ‘orgone,’ if we include the emotional level? Seriously: Pass the ball of interesting neurological discoveries to social science, summoning ‘Stop fiddling and start playing!’

We can no longer afford to stumble on elementary errors. The fundamental postulate, of neuroscientific contributions to psychology, is firmly established: ‘There can be no change in the mental states of a person, without a change in brain states.’ This does not, of course, imply that changes in humanity’s mental states, and associated changes of habits, could be reduced to physical, chemical or biological processes in the individual brain. No such reduction to some part, to reversed causality, or to any one-way causation at all, as it comes to complex systems, is compatible with modern science. Yet, such primitive reasoning seems to keep on infesting professional discourse.

It has often been stated that today we have better understanding of the universe, than of our own means of approaching this universal reality – the human mind. In fact, the general bias affecting science of humans and humanity, is that it may continue disregarding the fundamental quality of its object, its cooperative nature. Thereby it allows for general research in human consciousness to start and end in studying humans as isolated substrates. Applied science often narrows down to treating special cases, or specialising in restricted aspects, never aiming at generalization. And it is in such primitively confined instrumentalism, that the human mind might continuously be treated as a simulacrum of a computer (the pitfall of natural science) – or as an unapproachable mystery (the cave of the humanities).

Such ways of posing the problem, could be compared to trying to understand the earth system exclusively by looking into a pond, or trying to understand the universe from the misunderstanding of the earth as flat, or searching for answers to problems of natural evolution in the Bible. All science on human existence must be based in the level, extension, and social quality of human association historically achieved. The second order approximation to human nature is an absolute minimum. You deviate from that on the pain of ending up in quasi-science.

'Body and soul'

The 'body-mind problem' has been discussed for thousands of years: Are the two identical? Can one be reduced to the other? Are they separable? Which way does the causation between the individual body and its isolated mind act, if at all? Is there some degree of autonomy between them? Or do they exist in parallel? Even in dual realities? Is one of them only imaginary? Or are they both? Can the human mind know anything about the material world? Can study of the material world discover anything about the human mind?

Stop being sarcastic! Of course, base level modern research has advanced far beyond such things! Really? Let us see: Maybe, we could de describe the workings of the human mind, by a simple analogy to the way genes work in physical reproduction? Could we denominate such 'findings' as 'memes'? Or maybe we should look for the 'ether' or 'phlogiston' of the human mind – a substance called, say, 'qualia'? And so on. If natural science had stayed in an analogously corrupted dead-end of speculative alchemy or electro-magnetic spiritism, we would never have experienced its golden age of technical and social modernization.

Nor has it been helpful stranding enquiry into the human condition, by general 'phenomenological' speculations on relations between an inner exclusively experienced individual 'self' and an essentially unapproachable external reality. Such methods of inquiry only constitute a misty dead-end of theoretically and practically outdated dualism. Enlightenment's dualist solution should be abandoned, together with its post-Kantian entanglements.

Self-organization is a human property. It is by nature collective. Searching for specific components and measurable proofs of an isolated 'self,' within research in the human mind, is thereby proceeding from a contradiction in terms. Since starting out from such primitive metaphysics, it gets stuck there, looking for humanity in a virtual no man's land.

Synapses, indicative of a certain type of human reaction, seem to fire well before cognition. This is becoming massively well-documented. OK. Does that make us bio-chemo-electric zombies? In 2017 the John Templeton Foundation and the Fetzer Institute granted 7 million dollars to an international network of neurologists, philosophers, and computer scientists, for a four-year research project – 'Consciousness and free will: a joint neuroscientific-philosophical investigation.' To put it bluntly, they were assigned to finally find out if you are possessing a 'free will,' or if you are a bio-chemo-electric zombie. Watch out in 2021! Look for an expensive and confusing disappointment, since their $7 million research question had been flawed.

Free will

Do you as human individual govern your own thoughts, or do pre-conscious impulses enslave your thoughts? Can the human being freely choose and act according to individual caprice? Or is personal will a mere illusion, while outfalls of bio-chemo-physical impulses in the human brain, in reaction to external stimuli, carries the entire scientific explanation for paths of action apparently chosen? Since the millennium, recent pathbreaking findings have demonstrated that there is an organ of the body firing more synapses reaching the brain, than those that go in the other direction, namely the bowels. Maybe should these be included as the main agent of personal free will? Sorry, only joking!

As results from such neurological measurements seem irrefutable, though, they only accentuate how unreal it would be imagining human consciousness separated from the individual body, in any other meaning than the most decisive and obvious one – that the human mind is collective by nature.

However spooky it might sound, the design of these mysterious brainwaves, pre-consciously measurable, partially originated outside you, before they were

triggered inside you, since they were accumulated results of cooperation. It was the 'self' residing in the self-organization of human relations, that played the ghost in your brain. Does that make you a zombie, remote-controlled by other zombies? You would probably have to be 'artificially intelligent,' to get such a weird idea.

It is very telling, of the sorry state within the humanities, and of natural science attempting generalization from individual bio-chemo-physical expressions of the individual human brain, while disregarding human nature, that primitive questions like those on the 'body-mind problem' might continue to be treated seriously.

The same goes for the current stupidities concerning 'free will.' As long as two extremely unrealistic options might still be placed in opposition, as if they were the only ones – either 'free will' as personal caprice, or as a personal illusion – we remain stuck in a fictitious dead-end.

By the way, hello again old Freud! They are going to start searching in earnest for your 'superego,' or your 'subconscious.' Which one of them will be detected first? Which one will prove ruling human thoughts? Now, brain scanning, computer processing mathematics, together with experts in philosophy and religion, will lay their heads together. The genie will be captured in the bottle and put to lab test in a flask.

Personal will, as the exertion of human will in general, is the relation in thought and/or action, emerging from some human need. A need, that has been awoken by co-evolving human cooperation and surrounding nature. A need, directed towards results from this combined evolution. 'Free will' can merely be free in exactly the sense, that such a human need is not necessarily denied, and that it might be pursued. Obstacles might be posed, either by natural or social conditions, not realistically permitting this gratification of needs, or by the immediate will of other persons, relationally more powerful prescribing it. The woman, trapped in an abusive relationship, is not really free to choose, until she eventually conquers the option, by actively regaining cooperative agency, which regularly requires cooperative assistance.

As can be seen, personal will, as an isolated matter, does not exist. It never has. It never will. It should be a no-brainer, that desire produced within and executed by an isolated brain, is a pure abstraction from reality.

The human brain is a biological organ, firmly entrenched behind a thick skull within the individual body. It is stimulated through five bodily senses, capable of filtering into it a quite restricted range of external impressions. The human mind develops through this organ. But it is extraordinarily impotent, taken in isolation, being the prime cooperative organ of the body. It evolves human consciousness

only within the socially progressing relations of the cooperative species. Posing the so-called body-mind problem, or the question of free will, on any other footing than this elementary one, is absolute nonsense and produces nothing else. ‘Garbage in – garbage out!’

Real-life desire

The radius of action and the effective power of human will are subjectively limited by the degree, to which the mindset has grasped the objective conditions of achieving that which is generally desired. This power, in turn, comes with life’s experiences. At the personal level, choice presents itself consciously as a dilemma. The person is confronted with a differentiated consideration, without self-evident options. This because of possibly complex repercussions within cooperation. Consequences of either choice are rendered unpredictable. Repeated similar choices, leading to regrets in comparable situations, might eventually produce a somewhat freer will. Especially when amplified by positive feedback from cooperation. It is not private exertion of personal will, however, that should interest us here since we are dealing with the collective and historical dimension.

Collective exertion of will is generally more powerful than the personal one, expressing a wider range of cooperation. To serve the ends desired, it needs to be guided by realistic principles. That means it should correspond to, understand, describe, appeal to, activate, and concentrate massive development features in cooperation, already underway through human self-organization, to possibly get success. Otherwise it will, if eventually reaching aggregate impact at all, ultimately serve someone else’s purpose, or produce some unintended result.

Adolf Hitler had celebrated ‘triumph of the will’ and gotten far, quite horribly too far. But the will of Nazism would soon fall harder, than the drop from the magnitude it had inflated itself into. The reason had been that humanity in its entirety had proven already averagely leaving behind its capacity for voluntarily enslaving or getting enslaved. And the real reason, for the barbaric radicalization of its self-organizing discipline, had resided in exactly this historical unsustainability (treating its root causes here would be a digression). Human will, sustainably altering the course of history, can only be asserted at the level of association historically achieved or achievable within human self-organization.

The question of will is not academic. Will we succeed as species, to take care of the critical result produced by our unprecedented success? Will we achieve an earth system managed and enhanced by us, and tolerating our overwhelming presence? This is the framework, in which the problem of human will is posed today. Not by being formulated thus by some research team, but by reality itself.

Unrealistically delving in reasonings around the possibility of ‘free will’ as personal caprice will vanish, together with dissolving effective incapacitation of the individual, in social mutiny collectively conquering generalized right of association. The naïveté in studying the human brain and computers as mechanical, comparable, and equal entities will vanish, together with the destructive and obstructive monopolization in controlling computerization’s powerful virtual means of cooperation. Human needs have reached a capacity, strong enough to influence development of the earth system. And the means for this are historically ripe for true human interactivity.

Natural history has reached a point, where the question of human will might and must be posed seriously as a scientific problem. It cannot be posed as a simple research question, but rather as a problem-complex-hypothesis. Our species has reached global impact, of a magnitude that trumps earth system balances. This result is produced through abundantly developing means of cooperation. The design and use of these means are biased and distorted, fitting the unsustainable and destructive social interests of a small human minority, threatening to end in global catastrophe. So far, an overwhelming human majority remains socially paralysed. In short, class society still obstructs a solution to the Anthropocene crisis. Tough insight to reach, orient within, and decide upon! But such has become the conditions of free will.

Although the reasoning above refers to and reflects a multitiered and complex reality, it does not take rocket science to understand and test the relevance of it. To put it more succinctly: Human agency is just like human intelligence – essentially collective in nature. And the presently contradictory status of this nature is transforming into a global razors edge, in need of cutting-edge science catching up.

The questions are: Do we want to use this power for constructive ends, solving the Anthropocene crisis in saving biodiversity at Planet Earth and reaching cooperative abundance within humanity? Are we ready to face the real preconditions for doing so, by commonly taking the challenge of the third phase transition? Has our understanding become mature, that this is incompatible with class society and perpetuation of its linear metabolism? It is into this human-planetary level that the possibility of exerting free will has moved. It is there that it is evolving. That fact is not random. And it is testable. The choice is not easy to exert in practice. But it is essentially free. What is required is that the options, and their concrete conditions, start to clarify themselves to all and sundry.

Scientific integration requires correct ontological separation

Which are the fundamental problems, rendering possible the myth of 'artificial intelligence'? That issue might go as deep as to ontology. Mixing up entirely different levels of reality, false notions are created. Thereby scientifically validated methods of approximation and reduction could be interfering with levels where they are not applicable. Such conceptual corruption might then produce the very opposite of scientific integration – dis-uniting contamination.

This turns out to have some connection to the pluralism and fragmentation, produced in the wake of compromised or failed scientific integration efforts. And the impression is that information theory has found itself at the centre of such 'interdisciplinary' confusion.

Fragmentation of the knowledge process appears to have been critically aggravated by post-modernist constructivism. It seems like any given academic discipline might produce a 'specific ontology' of its own – like 'parallel universes' in academia.

Reduction is indispensable in science. It is the very method, by which the human mind detects regularities in nature, and encodes them in an optimally simplified and condensed manner in the abstract, by symbolic representation. The crucial test of such simplifying reproduction, through formulas produced by collectively accumulated human intelligence, is whether such modelling results in either predictability or prognostication. Which one of these becomes possible, is depending on the degree of complexity involved. Thus, human cooperation empowers itself to act distinctively upon its environment, ending up in the expected results desired. If complexity prohibits outright predictability, the aim might be working for successively approximating the ends intended, theoretically and practically. It is precisely here, that the need for scientific integration becomes unconditionally necessary. Permanent feedback between the system and its scientific modelling gets imperative. This is the case of human scientific practice in the Anthropocene crisis.

For scientific integration to succeed, however, approximative methods for separate levels of reality cannot be mixed up. Reduction to a level not applicable to the object studied becomes obstructive. Research based in overly mechanistic simplifications of complex systems typically produces false resemblance, instead of scientific approximation. Falsification of such dead ends of enquiry has been and remains an integral part of the scientific process.

Approaching human nature as a scientific object, departing from humanity's current condition, requires all due respect to its fundamental character. It is self-organizing in expanding cooperation of increasing profundity, at rising levels of

association. This approximation cannot be easy, partly due to the political corruption of social sciences, necessarily produced by the class societies, through which human civilization has developed. Civilization's right of association has been effectively monopolized. This also implies conditions of scientific consensus, particularly in studying humanity itself.

In principle, however, it should not be more impossible to penetrate this obstacle, than it has been for example for physics to explore the counterintuitive qualities of space-time and quantum mechanics. On the contrary, the basic qualities of cooperative self-organization, at the basis of which scientific integration can start out, requires much less theoretical power of abstraction, than for example the mathematics of theoretical physics. It would be more accessible, due to its non-mathematic way of approximation. And it could be quantitatively measurable and self-validating, at the interface of humanity and nature, in their phase transition into globally advanced circular metabolism. The Anthropocene crisis has provided a unique opportunity of approximating, describing, forecasting, and acting towards human nature's reintegration within itself and within surrounding nature, as the decisive independent variable in integrated science.

Three ontological levels

Taking the liberty of formulating the object of physics in an intentionally semantic way, might serve as a provocative starting point. Scientifically it would be anything but optimal. Being completely devoid of mathematics, and thereby deprived of any understanding of all the discoveries which have produced our modern technology, and our hotly disputed cosmological understanding, it might illustrate the peril of methodological displacement.

If the level of coordinating energy, constituting matter, and of dissipating matter performing physical work, should be confused with the exceptional level of life's energetically organizing matter, no distinct scientific formulas could be maintained in biology. Approaching humanity, in a similar scientific corruption by inappropriate reduction, would produce even worse results. Confusing the physical and biological levels of material reality, with the exceptional level of life self-organizing in cooperative progression, the whole representation of reality must be blurred. Distinction of these three ontological levels – cosmos, life, and humanity – cannot be considered arbitrary. The heterogeneous regularities, occasioning such dissimilar kinds of approximation and reduction, had been produced by natural history itself.

Two pioneers of information processing

We live in the 'information age.' We may start approaching its ontological troubles, by sketching the fates of two pioneers, Norbert Wiener, a prodigy of abstract mathematics, and Claude Shannon, a cross disciplinary engineer-inventor at Bell Labs. The two of them were highly skilled in applied mathematics. Both had contributed in solving technological problems of the US military during the Second World War. After the war, their respective findings would become instrumental in development of electronics, computerization, automatic control engineering, telecom, and IT. Each of them had published seminal works in 1948, Shannon's *A mathematical theory of information* and Wiener's *Cybernetics: Or Control and Communication in the Animal and the Machine.*

As suggested by the titles, Shannon had aimed at the purely mathematical side of accurately transmitting and processing information, disregarding its content. He would stick to that path. Wiener, on the other hand, had opted for scientific integration and its ontological implications. The US military industrial complex, and its civil technological spin-offs, were to immediately and continuously benefit from Shannon's formulas.

Biologists and social scientists, aiming at scientific rigour, advancement, and prestige, were to flock at Wiener's Cybernetics seminars, struggling to feed their data into its mathematical feedback formulas. Weiner's hypothesis of a synchronised carrier wave, governing the brain functions, was eventually to prove a dead-end. But the problem with Cybernetics had been more far-reaching than that. It had been based in ontological corruption, drawing too far-reaching and false conclusions, from the fact that mathematics, similar to those that had proven applicable to physics, even might seem to be applicable, in certain respects and with varying success, to animals, humans, and society.

Cybernetics was to fade in the polluted air of mechanistic simplifications of animals, humans, and society. Its Siamese twin had been an animistic understanding of high-tech, promising/warning of a future fabrication of brains. If interpreted as a general warning against detrimental social application of automation, which had certainly been an aspect, troubling Weiner and the cybernetic subculture, it might possibly be regarded as farsighted. But what concerns us here, is its ontological confusion. Against that backdrop, it should not be hard to understand why we speak of an 'information age' and not a 'cyber age,' although 'cyber' would stick as a prefix in common sense, describing the interface of society and high-tech, and linger on as a sci-fi fad. All well? Hardly.

Shannon's theory, and the engineering industry applying it, had basically stuck to the technical-mathematical side of information, without making any ontological claims. This also meant, however, that it had not denied the possibility, of its

mathematics being fundamental. It had proceeded from the entropy law, the dissipating regularities fundamentally governing the dialectics of energy and matter. It had not only borrowed and transferred its term, into a proper concept for treating the problem of noise in energy transmission. It had also successfully profited by the mathematics, previously implied in investigating this physical law. It should therefore not be surprising that proponents would pop up, of the idea that information should be regarded a fundamental property of reality. Even ***the*** fundamental property. A property beyond the elementary particles/waves of quantum mechanics. A more fundamental property, than those of the contested string theory, or of other propositions for 'new physics,' all aiming at a unifying Theory of Everything, integrating quantum mechanics and Einsteinian relativity. Does such a claim, on mathematical information as ontologically fundamental, really matter? Energetically, yes!

Information's proper place in universe

Information pertains to the human level of self-organizing life. It is there that abstract encoding and symbolic representation of reality creates pattern recognition. It is there that this skill is guiding perpetually progressing self-orientation. It is there that it originates increasingly collective laborious interaction, within the regularities of nature. Humans are cooperating, in their self-evolving right of association. Cooperation ***is*** emotional interaction by information. That is an evolutionary emergent property of natural history. So far it has only been discovered, as far as human science is concerned, at Planet Earth. Here, it is uniquely species-specific.

It is ***not*** information, which has been ***found to be*** indestructible, according to the first law of thermodynamics. It is the ***regular properties***, of interchangeable energy and matter. It is those that had been discovered by theoretical physics. It has ***described*** them, with ever greater precision by mathematical symbols, formulas, and systematic abstraction from the concrete world, accessible to human senses.

Ascribing information as such, to entire reality as a fundamental quality, corrupting the first thermodynamic law into 'indestructible information,' implies a teleological worldview of mechanistic determinism – a semi-religious and untestable dead end.

Information theory had been inspiring and informing a host of other disciplines, within both natural and social sciences. Within this scientific diffusion, a confused reductionism to a corrupted entropy concept has been spreading. Entropy – increasing disorder – in production, transmission, and processing of information,

and in physics respectively, are ***not*** the same thing. Of course, the former is conditioned by the latter. In physics, entropy describes the second law of thermodynamics. The concept entropy, transferred to information theory, is the calculation of IT effects from this law.

By dissipating an interpretation of the human artefact of information as ***the*** ontological quality of reality itself, a strand of information theory has been contributing to animistic mystification of its own devices, and to metaphysic reification of the human mind. In turn, this has grown into an unintended diversion, from critical scrutiny of the social sources, contents, and implications of contemporary IT design. The myth of 'artificial intelligence' has been thriving in these contaminated waters.

The very techniques, emerging out of information theory and gaining great scientific success within a broad variety of fields, has nothing to lose in cleaning out such ontological pollution. On the contrary. Human responsibility in the Anthropocene crisis conditions craves such a step.

Our species is the ***producer*** of information. We ***are*** its interpreters. We ***should*** freely share its produce. We should ***collectively*** bear the unique responsibility for these capacities. We might only control sustainably the fruits of them ***in common***. The present power of information technology, to artificially produce, collect, mine, auto-improve upon, and interpret data, far surpassing the capabilities in speed, mass and aggregate association, possessed by individual or group exhibits of human intelligence itself, is already under exponential development. Such technological power must be disciplined to the requirements of optimal human interaction, within life's circular metabolism at The Blue Planet. That is imperative, for transforming it from a destructive force to a constructive one. We should understand, take, and develop that human right in equal association. Otherwise, information that we have evolved, would go extinct with us.

An important contribution by skilled delusion

One of the more important features of scientific enquiry, is attempting to test a hypothesis to its ultimate consequences. Getting it all wrong is more fruitful and contributing, than being pragmatic or eclectic. We might take renown physicist Max Tegmark of MIT, and his *Our Mathematical Universe* as an illustrative example of where mathematicism (monotheistic worship of math) tends to end up. Tegmark is a self-proclaimed idealist of 'radical Platonism.' By practically idolizing Schrödinger's wave function equation ('The wavefunction never collapses. Ever'.), one of quantum mechanics' apparently absurd effects seemed to be avoided: The expression of Heisenberg's uncertainty principle at the human

interface, the yet unsolved ‘observer effect,’ famously illustrated in the thought experiment of ‘Schrödinger’s cat.’ But that advance had come at a price!

Entire reality was boundlessly expanded into an infinite number of parallel universes, at that existing at four different levels, by eleven dimensions. This limitless manifold would exist in a completely static and deterministic condition, where time and motion were reduced to simple illusions, together with everything that exists through them. All there was and ever will be was a perfectly abstract and perfectly working mathematical structure, the reasoning went. The human mind – a mere illusion, produced within the individual brain. The events of life – fragmented ‘observer moments,’ their uncountable and identic apparent agents instantly tossed in and out of different universes in all possible scenarios, un-knowable to each other, creating the illusion that something really happened and that something concrete would exist. Consciousness and self-consciousness? ‘The way information feels like.’ To whom? To… ‘nothing.’ Or more precisely: to the mathematical structure! Reality – a feeling ‘googolplexic’ computer? As could be expected, nothing would prevent this endless world of static parallel universes from being an enormous computer simulation, a hotly debated issue among physicists, cosmologists, and philosophers of this strand.

However, we should honestly thank people like ‘Mad Max’ Tegmark, for optimally pressing the mechanistic argument to its ontological conclusions, making it easier to evaluate it, in the prospect of uniting science. By virtually boxing the human condition into a corner, infinitely more claustrophobic than the concrete and real one that Stephen Hawking heroically had to achieve his pathbreaking science in, things might be contrasted. We should realize that the combined intelligence of Hawking and those closely related to him socially and professionally, as to human cooperation, seems to have been even greater than Hawking’s individual brilliance, as to mathematics and physics. (The movie *The Theory of Everything* might have succeeded in picturing exactly that.)

By stripping the human condition of all cooperativity, implicitly denouncing it as ‘redundant baggage’ of no ‘scientific’ consequence, in being non-mathematic, the mechanistic notion of ‘artificial intelligence’ started to make some kind of sense. More precisely nonsense, since the very premises had been one-sidedly dis-approximating reality. Be that as it may with the four-story infinite number of multiverses in eleven dimensions. It will be an open question and should so be, until further notice. One thing is clear, though. These kinds of sophisticated cosmological speculations are of no consequence to the urgent need of integrating science. In the ultimate-mathematicist version, briefly related here, they are immediately useless since they contradict the first and second order approximations to human nature and its evolution. In consequence, they also contradict the critical third order approximation.

Another thing is also clear. As such distorted conceptions of reality are influential in the network of 'futurologist' establishments (among others Future of Life Institute of Chita-Tegmark, and Future of Humanity Institute of Nick Bostrom), this mathematicist ontology lays claim to ethically guiding humanity, into the brave new world of 'artificial intelligence.' Do not try this at home, Planet Earth!

Artificial ontological division

Acknowledging the separate levels of complexity, and their respectively different conditions of scientific reduction applicable, is essential for successive approximation – the general concept of scientific progression.

When inserting an artificial division, however, in studying one and the same object, severe problems are created. Treating human self-organization, split up through such duplicity, engenders dis-approximation. Separating an allegedly distinct psychological level of ontology from the social one, as has mostly been done, generates obstacles to approximating human nature. On the contrary, such artificial ontological division guarantees confusion. The fundamental species-specific cooperative quality of humanity tends to fall between the chairs. Or it might be placed unilaterally at one level of association, or the other. Most typically, the individual nuclear family at the psychological level, respectively the state at the social level, are represented as the exclusive domain of cooperation.

Complexity and Chaos theories and 'self-organization'

Another ontological pitfall: Possibly denying the historical success of the reductionist method in science, by standing this method on its head, ascribing to these acrobatics a constitutionally general property of reality itself, tends to blur necessary ontological boundaries. Boundlessly throwing concepts like 'emergence' and 'self-organization' about, while not explicitly discriminating and re-conceptualizing according to ontological level, contributes to confusion. For exemplification, phenomena like the sudden emergence of complex scalable symmetric patterns out of dynamic chaotic systems – fractals – produced by small variations in simple initial conditions, does not prove that matter is intentional, as 'Chaos' or 'Complexity theory' sometimes give the impression of suggesting.

Life, as organically semi-enclosing beneficiary of intensifying external entropy, has benefitted vastly from such auto-coordinating properties of matter. And humanity has greatly benefitted from life's organizing properties, in its progression of social self-organization. But that evolutionary movie cannot be winded backwards, any more than time. Then you would end up advocating

teleology, which is not scientific standard, but philosophical speculation. Matter is ***not*** 'self-organizing.' Nor plants or animals (not even ants or chimpanzees). Only humans are – at least as yet cosmologically discovered.

The distinctive significances of things like auto-assembly or spontaneous symmetry breaking in physics, chemical molecular formation or reaction mechanisms, biological auto-catalysation within cells, instinctual auto-synchronization of animal populations' lives or flock-synchronized movements, digitised simulation of complex systems, et cetera, get lost by lumping them all together under the heading of 'self-organization.'

There might be a lesson to take home to humanity, which has been plagued by the antiquated centralizing dominance particular to class society, and continues to be so by its presently disintegrating remnants, from observations that decentralized elements seem capable of forming order at all ontological levels. That ought to mean we are free to search for such order within human self-organization. And such a quest is already gaining a great variety of dispersed successes. However, that does ***not*** mean that self-organization can be ascribed to material or biological spontaneous synchronization. Chaos theory and Complexity theory seem to have a similar fixation on the term 'self-organization,' as Cybernetics had had.

The globally existential conditions are presently being produced by our species in front of its own common visual field. Only general awareness is lacking, for starting to put into effect its cooperative potential as association. Releasing this unique force, from the destructive remnants of class society, is the key waiting to be turned. Self-organization has got a vast costume to fill, by associating at a level corresponding to the means of cooperation evolved. It is not wise throwing such a tool about, by proclaiming alleged 'self-organization' everywhere. Neither is it particularly sage forming 'trans-humanist' sects at the heart of Silicon Valley, lobbying for civil rights to allegedly 'self-organizing' computers, and even proclaiming 'All power to the computers!'

Emergence emergency

As to the 'emergence' concept, abusing it tends to drain it of useful scientific meaning. By indiscriminately referring to anything instantly and unpredictably changing shape, in a way none-reducible to combination of initial components, 'emergence' possibly becomes too unspecific. Such a wide application of 'emergence' seems to correlate to the unbounded use of 'self-organization,' 'emergence' describing, but hardly explaining, its implied teleological ascension.

Comparing everything from patterns in CERN printouts of particle collisions, or shoals of fish forming, to the behaviour of financial markets, might seem suggestive, but could hardly benefit purposes of research.

Maybe we cannot do without designating as ‘emergence,’ everything appearing suddenly in none-reducible ways. In that case, tentatively, ‘general’ or ‘fundamental emergence’ should be reserved for qualitative evolutionary changes in universal natural history, producing forms of existence requiring separate ontological determinations – origin of known universe, origin of life, origin of humanity.

‘Evolutionary emergence,’ could maybe be applied to succeeding eras within life’s evolution. As applied to life’s evolution on Earth, its origin out of terrestrial chemistry would then be ‘fundamental emergence,’ while its evolution into nucleus-bearing protozoa, sexually reproducing organisms, sentient animals, et cetera, would be considered ‘evolutionary emergence.’ But evolution into sentient-cogitative species – humans – socially evolving by cooperation, should be determined as ‘fundamental emergence.’

The last surviving one of these species, could possibly be re-integrating itself into the planetary biogeochemical life system. In that case this would constitute an epochal transition of the present era, an Anthropocene perpetuating human fundamental emergence, by a third phase transition in human metabolism. Anthropy, as an earth system socio-naturally co-evolving by collective human intelligence, might then be considered an ‘evolutionary emergence,’ or if you prefer, a non-extinction of the third level of fundamental emergence. ‘Emergence’ is not an idea to toy with, in times like ours.

Real rationality on Artificial Madness

A concluding ontological comment on Artificial Madness: In fact, ontological errors, confusion, and prophecies of a coming ‘great singularity’ of ‘’Artificial Intelligence,’ bear great resemblance to the animism of the first human phase. Although, with one decisive difference. Back then it was cutting edge knowledge. Today, it signifies ignorantly projecting the human characteristics of intelligence, on the verge of completing its collectivisation, into dead matter manipulated by it. This time it is animism barbarically accrediting life to sophisticated high-tech. By so doing, it is inadvertently contributing to a semi-religious cover up, for the presently destructive use of this powerful technology. This is the gravest mistake.

Integrating science – integrating society

The nature of the Anthropocene crisis has necessitated not only the integration of natural and social science, but also that of theoretical and applied science. After an atmospheric chemist and a marine microbiologist presented the 'Anthropocene hypothesis' in year 2000, the issue landed at the table of the geological research community. Suddenly the fossils, at their habitually tranquil work benches, seemed dancing in a new light. Such turning of tables within the scientific communities corresponds to massive development features of everyday life. Nothing will ever be the same within scientific research. Nor within any other walks of life.

The most important aspect of scientific integration concerns unified science massively entering everyday life, and the new socio-natural state of the earth system. This is the most complex task. But it is also the perspective, in which the necessary change becomes doable and concrete. Unified science will join in the front of burgeoning social mutiny. Scientists will have to answer the rallying call 'Listen to science!' by retorting 'Walk with social mutiny!'. The means of cooperation are the 'weapons,' necessary to wrest from the hands of the forces of mass destruction. Not to wage war, however, but to save the life system of the planet for the future, as means of mass construction.

End of 'two cultures'

The outlived rift between 'two cultures,' in bourgeois society's scientific approximation, is on the verge of collapsing. The study of humanity and of remaining nature, cannot continue as two separate domains, without any determined mutual relation, and without any common understanding. Such dualism, established during Enlightenment, had corresponded to capitalism's bifurcation of society into economics and politics. Such social dualism, of culminating exploitation metabolism, is no longer possible.

On the one hand, natural science had been engaged, in developing technology for economic purposes. The present radical change, in this mutually economic relation, cannot any longer be disciplined through linear metabolism. Science and exploitation are breaking their segregate social contract. By increasingly representing destructive forces, the economic-political principals of scientific-technological management are losing their authority. They are in a state of unprincipled degeneration. They are piling up walls against scientifically sound discoveries. Necessary and possible rapid scaling up of sustainable development

techniques and methods into massive currents, are turned down flat. President Trump and others of the same ilk have lent their wry faces to this decay. The fact that schoolchildren can tell them all off, says more than enough about their loss of authority.

On the other hand, the humanities and social sciences had been treating human relations in a wide and confusing variety of disciplines, from arts to economics. A common standard of scientific rigour, comparable to the one in natural sciences, had been wanting. And no such standard could be achieved as a segregate practice. It never will. Human self-reflexion, alienated from its natural historic context, cannot be achieved, and will not be realized.

Common scientific discipline will only be found in scientific integration, as human cooperation returns to integrated applied and theoretical science. Hence, to where labour had set it free at the dawn of civilization. This reintegration, however, will take place at an incomparably higher level of human association. Precisely thus will human cooperation reintegrate, within the natural evolution from which it once emanated. Our speciation's original alienation from the animal kingdom gets rehabilitated. Spiral closes.

In this ***natural historic feedback process***, even the false pretension of natural science as an objectively detached and external discipline, will be dissolved into scientific integration. That its theoretical research should have been a non-intervening approximation from the outside, proves to be an illusion. Likewise, the assumption that its applied science should have been unbiased manipulation. These delusions have, as a matter of fact, been just as unscientific as the religious and ideological arbitrariness of the humanities.

The very regularities, discovered and described with mathematical precision by humans, had been implemented within the work of labour. That does not mean that those regularities had been achieved through labour, neither human nor divine. They were the products of natural history. Neither does it mean that the mathematics, or semantic conceptualizations, utilised in mental human labour, for guiding physical human labour, can be understood as universal products of natural history. They had been products of human natural history – human artefacts. By emancipation from the logics of linear metabolism, such fundamentals might finally become common sense and scientific consensus.

Just as dramatically liberating might scientific integration work to organized human self-reflexion. If serving any immediate and precise social purpose at all, the humanities, as segregate part of dualist epistemology, had assisted politics, class society's given form of coordinated management. Such exclusive social corruption of research has now become a paralysing dead-end. It is no longer possible. It is no longer necessary. It is no longer desirable.

This dualism of science, which had celebrated such a revolutionary success ever since Enlightenment, can no longer serve as organizing principle of further approximation and advancement. It would spell disaster, since inability to meet the challenge of the Anthropocene crisis would be the end of science. And ability to succeed, in humanity's third phase transition, is completely dependent on successful scientific integration.

A new way of associating

In everyday life as well, dualism has become obsolete. The cleavage of society, in economy and politics, as two separate spheres, layers or disciplines, does no longer correspond to the way we need to associate and self-organize. This social dualism is not capable of solving the Anthropocene crisis.

The old normal cannot continue. A life where the great majority of people constitute society's resource, while exerting no influence over resource use and possessing no way of changing course, is no longer sustainable. This labouring majority is dependent on minding its proper business privately, while a tiny minority is controlling the aggregate resources of society, in segregate and short-sighted self-interest. The majority can only change course, in the interest of society, of the planet, and of life, by freely associating. This is tantamount to breaking up from its incapacitated social status. Majoritarian self-organization means social mutiny.

The new normal must complete, combine, and concretise already massively accumulating development features into concrete principles of human daily interaction, uniting a social order of equal grown-ups. A system is acutely needed, embodying incentives to save and promote life at The Blue Planet for enhanced life of future human generations. Its breakthrough would immediately saturate the parched need of human cooperation, simply because of the immense scale and intensity of the task. Integration of human production and consumption, and the re-integration of this overall process within the circular metabolism of planetary nature, is incompatible with the exploitation principle.

The constitutional principles of class society – state and property – do no longer hold any possibility of furthering human cooperation. Generalized associationism needs to de-segregate and de-propriate human cooperation, in order to complete the third phase transition.

Exactly this shift should also be concretely and immediately expressed as a globally active currency. Flow-organization of integrated human labour and ecologically natural energy needs an exact and stable measurement, even more than the capitalist market ever did. Emergence of a concrete currency, reproducing

equalizing and globally sustainable resource balances of advanced circular metabolism, would represent the only possible ‘soft landing’ of coming financial crashes. Avoiding further evermore catastrophic collapses, in abstract capital’s self-liquidation process, can only be accomplished by combining, scaling up, and instituting self-organized independence of such a non-fungible measure of sustainably balancing sovereign human interaction. The technical means are all already present, for developing such powerful means of mass construction. This has been demonstrated by the destructively corrupt hybrid-form of ‘crypto currency.’

The obstructive means of struggle, that once had provided the labour movement with force, have today lost their meaning. Construction – not obstruction – has become an absolute minimum in the third phase transition. For example, a general strike must immediately transcend into taking over direct resource control, to gain anything at all. When doing so, however, it might become the transformative pivot.

It is in such a context that introducing and gaining momentum of a Humus currency gets rational. Within integrated associations, an axis of self-organized productive and scientific labour would form their organizing principle, leading optimal conversion to advanced circular metabolism. By such integration of manual and intellectual labour at all levels of association, embodying integration of united science into everyday life, a natural metabolic standard of socially recognized labour would be constituted, a base level towards which other types of labour might be commensurately measured. In short, science and the working class need to clinch hands. This combined force needs to criminalize abstract capital and break the global wave of reactionary populism in one and the same act.

Labour servicing human consumption, or human cooperation servicing human relations in various other respects, like social care, education, theoretical research, eco system services, et cetera, would be free to seek employment in, affiliation to, or association with, such a networked base level of human association.

Such a social leap, corresponding to completing a phase transition to globally advanced circular metabolism, could of course not take place within the old normal. For this disintegrating order is no longer normal at all. It has become disastrously abnormal. A shrinking social minority is controlling society’s and nature’s resources. It depletes them in narrow, short-sighted, and thoughtless self-interest. It forms a separate and autonomous civil society around its abstract capital, which is no longer involved in human development. The general public is left to comply to the destructivity of this civil society, or to drop out of. This is no longer sustainable. Neither is this minority’s disciplining of human resources,

through wage labour, nor its association to this effectually powerless majority, through a fictitious political equality of state membership – citizenship. Citizenship, in turn, forms obstructively exclusive entities towards other populations. Self-organized association, to save the future of society and planetary life, cannot let itself be hindered by these obstacles. All these things had been special time bound entanglements of socially indirect relations. They can no longer be perpetuated. The nation states and abstract capital are on the verge of collapse.

In fact, this social order has been self-liquidating since a century. It has produced a result where totally impersonal and absolutely abstract capital runs the business of society. Security traders at their computer frames are acting most slavishly of all humans in case they are still humans at all. For the unsustainable 'new normal' in this self-liquidating depletion economy is trading robots. They are auto-regulating the world market in abstract capital – the monopolized right to proceeds. Thereby they are monopolizing the entire conditions of global cooperation. It is representing 'AM' – 'Artificial Madness' – in all its naked monstrosity. This alienating mechanics is taking a further leap through the global Corona crisis, echoing like a warning shot of what is yet to come: 'Robot's hungry!' 'More zeros!' And the central banks are nothing but compulsive feeders.

The sustainable new normal is quite opposite to this destructiveness. The new way of associating already grows by leaps and bounds in thousands of different ways. This introduction is not the place to develop this thesis further. Suffice it to mention a few negative determinations, outlining the course-altering spontaneously evolving. Self-organization tends to grow ***outside*** political parties and government sponsored institutions. Fields of research tend to ***break up*** national, institutional, and commercial boundaries, in order to advance. Cash as the general expression of property is ***vanishing***, being replaced by balances virtually reflecting alleged resource contribution and consumption. Virtual currency tends to break ***loose from*** the global banking system. Exchange tends to spread peer-to-peer, ***apart from*** market institutions. Trust rating of strangers built on recorded performance tends to move ***outside*** credit rating, as peer-to-peer feedback from self-organized interaction. Efforts at sustainable innovation tend to ***perforate*** bureaucratic inertia. The intimacy of emotional life tends to move ***out of*** the private sphere to enter global transparency. Centralized media production is tending to be ***submersed*** by self-produced information. In the Corona crisis, science has tended to ***round*** political corruption, publicly communicating the method of successive approximation to real life in real-time. Human self-organization is obviously in a state of ***transcendence***.

The fact that such divergences tend to end up in corrupted aberrations, so far, only testifies to these intuitively trickling development features of social mutiny still

being too indistinct, irresolute, and mutually isolated. Social mutiny is yet only crawling. It is still lacking the balance, skill, constructive focus, and coordinated consciousness, needed to walk, and to resolutely head for its natural historic aim.

Integrating science will of course be a complex matter. It is necessary to aim at, but impossible to complete, until human self-organization altogether gets focused on solving the Anthropocene crisis. The processes towards this fusion of scientific and social association are intimately interconnected. Integrating applied science in everyday life, integrating labour and consumption of social life, integrating natural and social science into a completed earth system science, and in turn re-integrating humanity within nature, are all expressions of one and the same process – social mutiny against the disintegrating and socio-naturally unsustainable remnants of class society. A new life now begins.

Social conceptualization

Human society had made itself quasi-enclosed, through linear metabolism. Now, this natural historic status has proven unsustainable. It has come into acute conflict with the semi-closed earth system.

Society is the second most complex system that we know of. Its interaction within the semi-closed earth system is the most complex one. This interaction now needs to get synchronized. Entire humanity needs to re-adapt. The critical independent variables reside within humanity. How can these be represented scientifically?

Complex semi-closed evolving systems

Complex systems, like for example global climate, are studied by successively building, revising, amending, and fine-tuning models. These are evaluated in comparison to measured outfalls. They are corrected according to best understanding of what interference should be included in, modified within, or excluded from a respective model, to make it more exact and powerful in forecasting. At the level of complexity, where human-induced independent variables have been detected – most conspicuously greenhouse gases – which have been studied, measured and mathematized, together with data from dependent variables – above all atmospheric average temperature and chemical changes of oceans – power of prognostication is being achieved. By successively discovering, measuring, assessing, and combining positive feedbacks of the earth

system, integrating them with detected negative feedbacks, the simulations of the models have gained in certainty and precision.

Since we are only dealing with models representing combined observations, not particular substrates in isolated experiments or measurements, running various models in parallel is not excluded, but rather recommended. Replicability of simple experiments constitute a crucial way of establishing individual scientific results, through achieving predictability. In the study of complex systems this corresponds to compound modelling approximating higher degrees of converging precision, to be able to make prognoses. In such prognoses, real-time feedback and fine-tuning will become increasingly crucial, as human interaction matures into claiming them for active current use.

Scientific consilience at the fundamental level of natural science – physics – has produced identic results and conclusions, not only by repetition, but also by distinct paths and through different methods. That has contributed to empirical robustness, verification, and predictability. In studying complex systems, however, consilience gets even more important, although for an opposite reason. It is more gradual and less spectacular than in physics, in addition aiming at a moving target. This means it may never realistically pursue full-scale verification and predictability. Then, scientific approximation, by globally conciliant convergence, becomes a permanently ongoing process. The earth system is complex and dynamic. So must humanity's surveillance of, adaption to, and preservation of it become – collective intelligence in the earth system.

Can society be modelled?

Human society is too complex a system, displaying such unpredictable volatility, that it might not be readily mathematized, no matter how much data you would feed. Even less under conditions of class society and linear metabolism, where opposite social interests, opposite self-organization and opposite driving forces of self-preservation, have intersected society's cooperative fabric and clashed in unpredictable ways. Moreover, the effects of linear metabolism have remained largely un-surveyed and un-measured, to the degree and at the scale of metabolic development. Especially as it comes to the entropic output end of the line – pollution. And certainly, social courses of events have become harder to anticipate, as class society is disintegrating in an unprecedented crisis process.

The question is: Might this complex system, in unparalleled turbulence, be modelled? The brief answer is no. Not unless you start thinking about the problem, in the perspective of self-organized scientific integration. Then you might approach the very opposite of bureaucratic 'social engineering,' which had

produced such devastating results during the twentieth century. Scientific modelling of human society can only be achieved by generalized self-organization, through transparent real-time feedback within everyday life, of its status within the planetary life system.

Fundamental development features

Such a perspective should depart from detecting and interpreting massive development features of contemporary self-organization. First, two opposing features should be noticed. The accelerating process of class society's disintegration is one of them. The increasingly rapid development of cooperative means is the other one. These two features are presently united. This unity, however, is critically instable. In a natural historic perspective, it is cooperative development that is the independent variable. Dissolution is perpetuated by this development. Even class society's disintegration being human development, it must be so.

These critically associated opposites really distinguish the present age. They are fundamental development features. They express the currently critical condition in human socio-natural evolution. Therefore, modelling of society should start by focusing these opposing features. Otherwise a realistic overall picture would directly be lost. Contemporary social conceptualization should be based on that counterintuitive insight – disintegration by association. And it should aim at reintegration within humanity and within Earth's life system, by right of association generalizing itself.

Disintegration corresponds to the crisis of the second order approximation, the right of association: The present level of human association is critically inadequate to the level of human evolution reached. During the twentieth century, associative resource control has been narrowing and alienating itself from the real life of human society. Monopolized right of association has ended in globally inflated markets of absolutely abstract capital, parasitizing upon real human cooperation. This state of things moves towards collapse, for social as well as natural reasons at a global scale.

Association corresponds to the potentiality evolved out of the first level approximation, the cooperative species-specifics: Means of cooperation are becoming abundant. But control of them are still monopolized. These means involve human needs awoken. Monopolized control of these means signifies human needs not fulfilled. An unprecedented rift in human needs has resulted, corresponding to the globally critical rift in nature's cycles. The combined force of these needs and these means press for a natural historic leap in human associability.

Twentieth century disintegration by association will be analysed at the decisive economic level in the first book, through the formula of capital abstraction producing industrial repulsion. Right of association is being ever more unsustainably monopolized by increasingly abstract capital formation. Abundant development, in virtual and material means of cooperation, tends to associate humanity in social mutiny against that destructive impact.

Demise of 'social engineering'

Scientific modelling of society can never be a case of successively approaching greater exactness, in observing an externality. It is by nature integrative. It could only be achieved by decentralized intra-calibrating measurement and management within human metabolism. An externalist misconception, however, had been typical of twentieth century restorative bureaucracy, claiming aptitude for social engineering. That type of delusion might now be evaluated as a completed natural historic experience. It has been disqualified. Bureaucratic 'social engineering' had produced associated abstract capital, world wars, totalitarian labour states, the Holocaust and other genocides, weapon systems of mass destruction, and a failed 'world order' producing the Anthropocene crisis.

Human nature is not static. It is evolutionary. Therefore, society cannot be understood and formulated in unchanging laws either, like in theoretical physics. Of course, classical political economy, and even more its neoclassical bastard offspring, had been the prime outlets for the misleading trade description of 'perfect market.' That pretentious failure has now become a catastrophe waiting to happen. Hyperinflation of perfectly abstract asset valuation is terrorising humanity and the life system of the planet. Human nature needs to catch up, grasping the nature of that acute crisis.

Reading and analysing self-organization

Society is, by definition, self-organizing and historically evolving. Detecting, describing and projecting society's amassing of development features, is the subject matter of social science. What are their social sources? What are their directions? How do they conflict? What potentialities, in relation to the overall picture, might they express? How might they change place and function in accordance with such potentialities?

Fundamental questions, of this sort, relate to human cooperation and association. None of this can be mathematized. It must be approximated by ***semantic conceptualization***. Complexity of the system requires this. Also, the complexity

of its individual variables needs semantic conceptualization. Individual variables might of course be tested by social statistics.

End of pragmatism

A social regularity, causing complex patterns to develop, conflict, and change nature, cannot be understood by simply observing and describing what appears. Abstracting observations of generally changing patterns from incidental impressions, conceptualizing these as well as their interrelations, is an essentially different and more dynamic kind of enquiry than natural scientific experimentalism. The sound conservative claim of natural science, of repeatability, verification, and predictivity, cannot be applied in analysing society. It would not gain any firmer foothold, than applying prejudice of the past to a reality in rapid change.

Non-systematic approximation to a system itself rapidly self-altering, as in the unique self-organizing quality of human society, may at most become intuitive pragmatism. At best it might produce sharp hindsight, which may possibly inspire new paths of cooperative mass manifestations in reaction. At worst it would simply become adapted rationalisations of outlived patterns of reaction, merging into and reinforcing these.

The Anthropocene crisis needs systematic treatment

Under conditions of the Anthropocene crisis, however, systematic scientific approximation will be urgently needed. Its starting point is not random. In a certain sense, this approximation is even less random, than the principles discovered and described by natural science as scientific laws, since the cosmological origin and framing of the latter are still hotly contested, and seem to remain so for the foreseeable future.

Approximation to the Anthropocene crisis narrows down to a tiny spot in universe. The domain of crisis solution's independent variable is a given. Determination of its natural historic character is acute, but that should be a problem already solved. The basic scientific principle describing humanity, including its origin and its present state, evolving into the magnitude of a rapidly changing planetary socio-natural law, should no longer be contestable. It cannot be anything else than the ***first-, second- and third-order approximations to human nature***. Humanity is a ***cooperative species***. Its basic scientific principle is its ***self-organizing right of association***. This principle it now ***confronting its***

global life crisis. The independent think tank right2unite is being founded on that insight.

Determining the short-term social variable, causing, driving, and aggravating the Anthropocene crisis, might be trickier. The first book of this work is an attempt at isolating that variable, which if successful might start opening for distinguishing and concretizing the natural historic variable of crisis solution.

Scientific approximation to society needs abstract conceptualization, just as much as physics does. But the laws of social development are expressions of social history and change accordingly. This does not imply that they are purely random constructions of the human mind, ready to be deconstructed and reconstructed according to academic fashion, as 'post-modern' liquidation of social science claims. On the contrary. Even greater scientific rigour is required, to epistemologically approach something which cannot be subjected to repeated experiments, formulated in equations, and established as unchanging laws.

Not only are the development laws of human society unsuitable for mathematical abstraction. Due to both their complexity and their changing nature, they should be formulated as historical tendencies, not as exact, static, and experimentally repeatable regularities (like for example in the more pretentious claims of game theory or econometrics).

In fact, such tendential and historical laws change with the social systems they perpetuate. For example, the law of labour value should be understood as time bound and characteristic of the capitalist period. The law of accumulation, exploitation of surplus value out of expanding industrial wage labour, had been a sign of the times. The law of tendentially falling profit rates had resulted from the growing force of these laws. It had expressed the distinctively transitionary character of the capitalist mode of exploitation. Today, within the present phase transition, these laws are disintegrating.

However, the more basic, natural historic, socio-naturally co-evolved, and species-specific ***law of human cooperativity*** is coming to the fore in its own right – human self-organization as expressed in an ***increasing right of association***, and the ***critical natural historic deficiency condition*** of this associative right.

Core concepts of organizing principles

Massive development features, emerging historically within human cooperation, constitute social forces. Detecting, describing and conceptually determining the relations between such forces, is the subject matter of social science. Not even the

study of human individual sociality – psychology – can be successfully pursued in isolation from its social context.

As already stated, scientific concepts in studying human social evolution cannot be mathematized. They need to be semantically formulated. The semantic concepts needed might form fruitful hypotheses by, ***primarily***, fixing terms for massive development features observed, which can be understood as directly relating to the first, second and third order approximations to human nature. Such basic determination of concepts is in this work often referred to as '***core concept***'. An extant expression of the second and third orders – of right of association and its critical condition – forms the basic determination of a core concept during the Anthropocene crisis.

For simplification, we might cite some earlier, presently obsolete, examples. During the eighteenth century, citizenship of a nation state became a core concept of politics. Accumulation of capital, by hiring wage labour, became a core concept of economy. Twentieth century has displayed a crisis and dissolution process of these core concepts. Under present conditions, human association needs to transcend those limits. This assertion starts approximation to ***generalized associationism***, by negative determination.

A core concept refers to an '***organizing principle***,' of evolving human cooperation. It expresses a contemporary development form in right of association, that has become historically possible and necessary, or already achieved. Democracy was the organizing principle of citizenship. Accumulation, by industrialization of hired labour power, had been the organizing principle of capital.

Presently, the organizing principle of humanity has become global. This fact has not yet found its constructive realization, as an aggregate positive form of development. But the states of the global financial markets and of Earth's life system proves it negatively and destructively.

Reactionary organizing discipline

Much of social development, however, does ***not*** express historical advancement. Especially not under the present conditions, combining crises in social and natural history. Social forces, expressing such reactions, might be termed 'zeroth order approximation.' Simply by being human, they need to adopt and self-organize in cooperative form, even in cases neither spreading cooperation, nor advancing human right of association historically mature, but rather obstructing them. Of course, massive development features expressing blind reactions, rather than possible historical solutions, should not be left out of the picture. In such analysis,

zeroth order ‘organizing ***discipline***’ should be basically reserved for referring to more short-term and randomly appearing massive patterns of reaction, impeding levels of association, the historical conditions of which are already developing. Let us briefly look at a few examples.

Imperial restoration of mid-nineteenth century France, in the political void produced by competing monarchist-restorative factions after the 1848 European revolutionary wave. Or 1975 monarchist restoration of post-fascist Spain, based in fear of Portuguese insurrectionist contagion, produced by fascism’s collapse in the neighbouring country. These historical instances might serve as randomly picked examples of reactionary organizing discipline of human cooperation.

Looking for more powerful manifestations, of course leads to the barbaric twentieth century dead ends, Communist labour states, or Fascism and world war. Supra-state organizing discipline of the Cold War, through the UN system, IMF, WTO, and other international clubs, has been breaking down. Contemporarily, the global wave of authoritarian and nationalist populisms, within disintegrating politics and obsolete nation states, presents itself as organizing discipline.

This untenable and disintegrating set of disciplines has been countering the currently global organizing principle of humanity, for more than a century. Globally generalized right of association is enrolling its forces, along all vital fronts. It is still not aware of its common principle.

Additional determinations of core concepts

As stated above, core concepts are ***primarily*** determined as central terms, directly expressing human nature at the contemporary level of human evolution. Therefore, they function as organizing principles of human self-organization, achieving the historically possible level of association. Let us now proceed, in developing conceptual apparatus, from this starting point.

Secondly, each core concept needs several additional determinations in order to gain precision. These are based in complimentary and more concrete observations of massive development patterns. In semantic conceptualization, additional determinations to the value of core concepts, serve a somewhat similar role as calculus does in studies reducible to mathematical formulation. There is no definite limit to how many determinations a core concept can get. Redundancy, however, is hardly anything to be strived for. Such procedure tends to produce disproportion, lack of focus, and non-dynamic understanding. As in all scientific approximation, optimal reduction is desirable.

Thirdly, as to the relations between concepts, those contradictions reflecting real social conflicts must be sorted out from contradictions in terms. Contradiction in terms contaminate determinations and hinder further approximation to real social forces. Contradiction in terms typically occur, as concepts from other disciplines, or terms from everyday language, are simply borrowed in an allegoric manner, arbitrarily tossing them in, without neither serious discretion nor clarifying re-definition and re-determinations. Such procedure results in randomness and confusion, rather than conceptual determination.

Another trap might be overdetermination. Structuralist modelling often forms static, overloaded, impregnable, arbitrary, and low-validity proposals for conceptual apparatuses.

If being a valid determination, referring to a real and contextually relevant social process, determining one core concept always places it in relation to another valid one. Such coincidence, where determinations of different core concepts relate, is conceptually formative itself. By thus associating concepts, successfully approximating real human association, a conceptual apparatus might be achieved.

The approximate validity of proposed concepts and conceptual apparatus might primarily be tested against the second order approximation to human nature – the right of association historically reached – as observed, described, and statistically measured in contemporary society. Ultimately, of course, the more exact validation of proposed concepts, lies in their approximate relevance to the conditions of the Anthropocene crisis.

Let us exemplify. Presently, we have a peculiar situation where absolutely abstract capital is globally associated, with securities becoming automatically inter-convertible through derivation and robotized trading. This does not express any organizing principle at all, but on the contrary an untenable, all-encompassing and self-liquidating organizing discipline. Nevertheless, this destructive discipline is developing abundant means of cooperation, only due to its zeroth order of simply being human, while threatening Earth's biogeochemical life system, together with 65 million years of natural evolution and three million years of human evolution. This explosive combination, in turn, is triggering humanity's need and possibility of completing the third phase transition to globally advanced circular metabolism – the presently organizing principle.

Fourthly, in the prospect of necessary scientific integration, validation of social concepts is particularly related to the ongoing phase transition from human linear metabolism to globally advanced circular metabolism. The possibilities inherent to the rate of cooperation achieved, are measured by redundantly developed means of cooperation. Alternately, from the perspective of human needs, the same

thing might be assessed as level of association not yet achieved, but inherently possible by conversion of such means.

This cooperative redundancy, in turn, should be set in relation to and measured by the successive results described by earth system science. This provides the very basis for going ahead with scientific integration, by transforming society as successively approximating self-organized emergency plans, related to the critical variables of the earth system, and to those of global society. Social mutiny in defence of life at The Blue Planet constitutes an ***integrative scientific and social principle at one and the same time*** – the ***organizing principle of our time***.

The role of mathematics and information processing

Human self-organization, taken by itself, cannot be mathematized. It is the density, scope, and quality of purpose in self-organization, that reflects to what degree the human means of cooperation developed have been realized as a further progress of the cooperative principle – right of association – or as a part of its obfuscation, obstruction and destruction.

The importance of mathematics, however, will of course become immense, in gathering and processing statistics for such analysis and synthetic conclusions. Meticulously measuring the expressions of dependent variables of the Anthropocene crisis, within nature and within society, stands at the core of scientific integration.

The great mathematical challenge will be concentrated to defining and measuring, in a commensurate way, the circular flow of energy, matter, and human labour at all social and geographical scales. A virtual Humus currency might concretise humanity's sustainable re-integration into the global life system. At exactly the interface of integrated natural and social science, theoretical and applied science, science and everyday life, mathematics and information processing will occupy the core role in developing such a virtual currency of globally advanced circular metabolism.

Such a currency would measure collective intelligence in the planet's life system. It would be based in monitoring and measuring the relative ecological and social status throughout the planet. It would balance self-organization's auto-contracted resource allocation, according to natural and social need. Growth would be measured as increasing aggregate resources, getting equitably available to society, as positive feedback from success in re-integrating it into circular metabolism.

That would no longer signify economy – the theoretical discipline of linear metabolism – which never managed to reach a prognostic level. It would mean

Anthropy – the general self-organizing principle of advanced human circular metabolism, within that of the earth system. A Humus currency would become the concrete principle, expressing and effectuating that general organizing principle.

Concrete principles

New trends in human self-organization have been provided with a socio-natural organizing principle by the Anthropocene crisis. The historically vital force of such trends might be tested, by measuring and evaluating them in relation to the requirements of this combined crisis. Are they already involved in completing the phase transition to globally advanced circular metabolism? Are they possibly conductive to do so? Or might they suitably be converted to do so? Such things should not be impossible to determine. Neither whether they are expressing the equal human right of the generalized associationism, needed to complete this phase transition.

Such progressive development features should be possible to distinguish from those trends in self-organization, which have come to express the opposite and destructive direction. Development features, that have obviously sprung out of the present disintegration of outlived class society, should be most easy to detect. But even which trends, traditions, and institutions, that perpetuate a form previously playing a progressive role in social history, but uncapable of doing so any longer, might be discovered in the litmus test of the Anthropocene crisis. Only to mention the most obvious, sensational, and counter-intuitive example: The self-organizing reach of democracy has become completely inadequate. Democracy's substituted right of association will need to be realized in directly generalized and global right of association.

In natural science the term 'principle' signifies an achieved fundamental concept, an established formula for understanding and acting upon the world. Originating in antiquity, for example, Archimedes' name was to be lent to the regular proportions of density to volume, in Archimedes' principle. In modern times, Max Planck had gone to history for discovering the mathematically fixable constancy in the relation of a photon's energy to its frequency. From the enlightenment onwards, at least since Isaac Newton's *Principia Mathematica,* which had been systematically investigating movement patterns of objects, and the magnitudes of and relations between 'forces' acting upon them, the term 'principle' stands for an empirically testable hypothesis on some fundamental regularity being successfully demonstrated, symbolically formulated, exhaustingly tested and established as incontestably true, by this scientifically sound method.

Natural science has generally left behind such methods as theology, teleology, natural, moral, or political philosophy, et cetera, as unsuitable for scientific enquiry. Relativism, in the post-modern sense of 'alternative truths,' corresponding to one's own self-defined identity, or arbitrary 'conceptual reconstruction' of reality according to academic fashion and career opportunities, are certainly not desired. Successive approximation is. If the space-time of general relativity could be proved to represent reality even more precise, by including the dimension of time, as compared to the equations of Newton, which it did, then Einstein's principles should be generally accepted. So they were.

In social science, the term 'principle' commonly refers to ephemeral and relatively random things, like political opinions and institutions, moral theses, personal beliefs, or judicial arrangements, reflecting contemporarily dominant social interests. However, in reintegrating humanity into the circular metabolism of living nature, which requires scientific integration, social sciences can no longer do without scientific principles.

The general principle of the cooperative species – social self-improvement of its inherited survival skill – lies in optimizing its own right of association. Having to proceed from such first- and second-order approximations, that are not possible to express with any singular or simple mathematical precision, does not imply that we are not dealing with scientific principles, only applying those with a different and more suitable kind of scientific reduction.

Humanity presently facing the global impact of its evolving associationism, provides basis for a further approximation to human nature, which by its very determination prepares for scientific integration. The global life system and human society converge towards one and the same organizing principle. It all boils down to the third order approximation to human nature – the scientific principle of our time. The anthropic principle, in this transferred, altered, and concretely verifiable sense, constitutes the scientific standard of the third phase transition.

The ***concrete principles*** proven conductive to, and therefore deductible from, this general principle, are those to be sought after among society's massive development features. They are the ones to formulate as core and supplementary concepts – concrete principles. They are the ones to promote and self-organize as practical association.

'Organizing principle' in this text, refers to a general historical form, expressing the fundamental human associative principle at a given level in social evolution. 'Concrete principles' refer to massive development features associated with such organizing principle. If the anthropic principle is the organizing principle of our time, expressing the right of association at its present level, then globally

majoritarian social mutiny is a concrete principle. Self-organized transparency as well. In the constructive extension, development of socio-natural co-working forces becomes a concrete principle. Such flow organization gets concrete, through globally decentralized auto-coordination by a virtual, de-propriated (non-property), de-verted (non-transactive), and de-sovereigned (non-state) 'Humus' currency. Such a non-fungible currency becomes the concrete principle of equitable and sustainable human cooperation.

The second part's first book will describe social mutiny's critical development, during the twentieth century conditions of phase transition. It will attempt to sort out the concrete principles its self-organization did tend to develop, from the organizing disciplines of political substitution that they were subjected to, aborting these concrete principles. The ensuing book will discuss the associative principle, and propose concrete principles expressing it within humanity under the conditions of highly advanced third phase transition. The concluding book will deal with the concrete – associative and natural rights – principles in the very transition to advanced circular metabolism – collective intelligence in Earth's life system.

Some problems of integrating science

Integration of natural and social science, as well as of theoretical and applied science, is a means to an end. This end must be to integrate science in everyday life. The ivory tower of academia should be mature for listing as an historical monument, together with the gated communities of state security classification, commercial research labs, intellectual property, patents, company secrecy, and banking confidentiality. The third phase transition to globally advanced circular metabolism needs human cooperation, that is truly integrated by generally equitable self-organization. Scientific integration can only be realized as a necessary integral part of social mutiny against class society. Unsustainable habits, conventions, and traditions can only be actively broken by being replaced in self-organized association, combining massive development features already spontaneously starting to break them all over the place.

Scientific renaissance

The critical conditions of the present phase transition had tended to spread as increasing scientific scepticism. The surging scientific optimism, which had

characterized research consensus from the Enlightenment to the end of the nineteenth century, had seemed to be broken with the twentieth century.

Kuhn's theory of 'paradigm shifts' is an example of disintegrating 'philosophy of science.' Kuhn had been denying scientific approximation, by claiming that science runs in essentially nonoverlapping circles, with one incompatible 'paradigm' replacing another. Another example is Popper's 'critical rationalism,' claiming the impossibility of scientific verification and the unique primacy of falsification. Popper had jumbled up approximative conditions of natural and social sciences, respectively. He had attached complicity in nurturing totalitarianism to those opposing the dogma of exclusive 'falsification.' Disciplines of social science had then brought decay further, by post-modernist 'constructivism.' It had been picturing scientific approximation as competing 'power relations,' where one faction of the 'scientific community' should strive for getting the upper hand, through 'deconstructing' the 'narratives' of competitors, and gaining consensus behind the proper one. Stalinism, quashing the critical vein of nineteenth-century Marxism, harnessing its terminology for temporarily successful state terrorism, had thereby played a decisive part in provoking such scientific demoralisation. This slippery slope of scientific scepticism is now reaping what it has sown, in the form of outright science denial, absurd conspiracy theories, and unashamed advocacy of 'alternative facts.'

Scientific approximation might not be a straight line. But in the long run it has proven an unquestionably successful one. Hypotheses might be falsified. They might be further strengthened *ad hoc* (thus far). Or they can be, for all practical purposes, verified. Scientific verification can of course not be regarded as something absolute. It is an ongoing practice of one single species at one individual planet. And history of science has repeatedly demonstrated that further approximation might need fundamental revision. However, approximation should be acknowledged as a material product of collectively accumulated human labour, expressing distinguished dots to completed sentences in an historically epistemological experience. This is especially true when reached through robustly converging conclusions from methodologically diverse enquiries – consilience.

The Anthropocene crisis constitutes an unprecedented opportunity for scientific consilience. It might develop into the massive breakthrough of integrated scientific approximation – ***life based collective intelligence***. This scientific possibility, and its urgency, are starting to be felt by general intuition. They are developing into a ***new generation of common sense***.

Parallel to the tendency of scepticism towards knowledge, which has reached rock bottom, and now meets a massively self-amplifying progressive counter-reaction – proclaiming 'Listen to science!' – a growing host of separate disciplines keep

advancing rapidly, covering an ever-wider range of fields. And the scientifically organizing principle of earth system science provides a common point of reference, grounded in the discovery of the Anthropocene crisis. We are entering a scientific renaissance without precedent. There are, however, specific problems of scientific integration, particular to natural and social sciences, respectively.

Problems of natural science

The crucial methodological weakness in natural sciences' way of approaching the problem of scientific integration is twofold. ***On the one hand***, they tend to apply to complexity levels where they are not applicable, their own reductionist methods. Methods that had served themselves so well, in advancing theoretical science of physics, chemistry, and biology, as well as in revolutionizing technologically applied science, prove to be too primitive if applied to overly complex contexts. Transfer of their own methodology of reductionism, to the study of complex systems, unsuitable for that degree of reduction, has not proven fruitful.

Typically, such reductionism claims that everything can be described and completely conceptually determined by mathematics. Alternately, it might be argued that only objects that can be studied experimentally and in laboratory isolation, or at least be observed and measured externally, may lead to scientific conclusions. Such a view implies leaving the independent variable of the Anthropocene crisis to complete randomness, as a non-explorable topic. That is, the central research issue of our time is abandoned.

On the other hand, this uncertain situation has sometimes led natural scientists to admittedly transferring their own solid concepts – like for example 'ecology' or its 'resilience' – to the social domain without fundamentally re-determining them. This has resulted in conceptual corruption and confusion.

Alternatively, and for lack of better, they have tended to adopt uncompleted, corrupted, failed, or outmoded concepts and theories of disciplines treating human society, when cross-disciplinary requisites have presented themselves out of the very research questions. Most typically some variety of neoclassical economics or political science has gotten inserted into the quasi-synthetic models, attempting integration. The global market of abstract capital has often been invited wholesale, masquerading in nineteenth century worn-out conceptual outfits, to rule the house of scientific integration. Thereby, the loss of scientific integrity has made scientific integration impossible. Only a mishmash has resulted. The perfectly destructive impact of the global financial markets might be euphemistically presented as a wonder of 'self-organization,' as a culmination of natural historic

evolution at this planet… or even in the universe (like with some simpletons of ‘complexity theory,’ impressed by the mathematical sophistication utilised, for optimizing abstraction of opportunity rent).

Problems of social sciences

Social sciences, the arts and humanities, have met their proper methodological impediments, which also could be described as twofold. ***Most basically***, its degree of difficulty derives from the subject matters being so complex that reduction after the fashion of natural science’s success cannot be useful. Nevertheless, the risk that concepts might be corrupted, due to the bare complexity of its object, has often led social researchers to try applying natural science’s mathematical reduction standard to its own basis.

Since civilization had proven mathematics to be humanity’s most powerful, precise, simple and abstract method of reproducing reality by reduction, this had produced a compelling force. In natural science, the fascinating elegance of mathematics had produced wonders of knowledge, predictability and technological advance. In social sciences, mimicking natural science, when applied abundantly for explanatory purposes, rather than as supportive sets of statistics for illustrating probability, mathematical formulas have not proven successful even in forecasting.

Of course, economics is the foremost case in point. And it has hardly been likely to cause astonishment, that exactly this false expectation of scientific precision by mathematical reduction, should become so irresistible within precisely economy, the practical application of which had demonstrated precision in exchanging of scarce resources for thousands of years. Nevertheless, mathematical reduction would prove of limited value, even in forecasting how human cooperation would come to develop within this narrow field.

The complexity of human society, however, is finally becoming apprehensible, by its tangible collision with the natural world it is part of. This is critical. Social science can no longer run away from the fundamental postulate, where its actual point of contact with natural science is situated – human nature, as it can and should be understood through the natural historic origin of the species, its social development, and eventually its natural historic impact.

Secondly, social sciences in class society had constantly run the risk of getting proposed concepts corrupted, not only in the internal meaning of conceptualization failing because of false determinations, irrelevant arguments, invalid interpretations, corrupted data, causal misunderstanding, shaky reference to correlation, unfounded conclusions, et cetera. Even greater has been the risk of

corruption in the externally social sense of spontaneously adapting to dominant social interests, thus one-sidedly dis-approximating social reality. This had been unavoidable. Nothing else could be expected, for as long as class society constituted the formal level of association, corresponding to the rate of cooperative development historically achieved. This had remained the normal state of things during human civilization. Consequently, the study of our own species is not properly adapted to the new situation, where class society cannot continue to exist.

The habitually sloppy comparisons of human cooperation to animals and their instinctual interaction amongst them do no longer hold. Nor does continuous reduction of humans and human consciousness to individual substrates. Research routinely influenced by state powers' and exploiting classes' habitual way of perceiving humans can no longer deliver. Specific cults or stigmatisations around some divisive social identity, typical of class society's social fragmentation, have become reduced to waste of time in an urgent situation.

Sociology, economics, and political science

A short glance at the state of three branches of social science might illustrate. The over-arching discipline of sociology, to some extent reflects the general problems of social sciences. The core discipline of economics is a good measure of the theoretical crisis corresponding to the social one.

Sociology had arisen as a specific discipline in reaction to capitalism's industrial revolution. Partly it had taken shape by criticizing its social effects, in the name of the 'social question.' Partially it had emerged by rationalising its dramatic ravages, for example by exploiting Darwin's scientific breakthrough in evolutionary theory for implicit or explicit racism – like in Spencer's 'social Darwinism,' advocating the 'evolutionary' right to ruthlessness of the socially most powerful, under the slogan 'survival of the fittest.'

Handicapping reductionism was to persist. Reduction to biology, to ecology, to interpreting human nature through the lens of time-bound contemporary social relations, et cetera, has remained a problem.

Economic science had, for obvious reasons, emerged and been polished as the crown jewel of social science. Political economy had been the discipline of conquering and managing the state in society's transition to the capitalist system. It had provided the emerging bourgeoisie – the political substitute of the capitalist class – with the courage and clear sight, that it had needed to head the breaking up of outlived privileges and hereditary obstacles to free enterprise.

During the twentieth century, the discipline of economics had converted into recipes for restoring capital formation beyond private accumulation, in the form of associated abstract capital, and for restoring wage labour beyond the boundaries of the industrial working class.

The new discipline of political science had converted in a similar manner. First into rationalisations of restoring the sovereignty of the nation state, in the contradictory form of belligerent blocs, covering a small human minority. Then into the disparate taxonomy of classifying formal state sovereignty, under the supra-state associating liquidation process of the nation states.

This bureaucratically corrupted political economy and political science, in the interest of abstract capital, had been oscillating from world and trade war to reactionary international social engineering.

Since globalization had broken the barriers restored, political economy and political science, together with the nation state and regularly contracted wage labour, had fallen prey to the global self-liquidation process of abstract capital, itself vaporizing. There is no more room for intelligibly converting them into coherent disciplines.

Consequently, the bankruptcy in the old way of understanding human society is most obvious within economics and political science. Understanding the end of economics as a separate linear discipline, and especially grasping – both in a mental and a real-life sense – the powerful means of cooperation created under abstract capital's self-liquidation process, forms the springboard of formulating sustainable concrete principles of globally advanced circular metabolism.

Evaluating Marx and Engels

Evaluating Marx and Engels, as well as their sequel, will be a necessary integral part of this work. Suffice it here to make three brief statements.

In sociology, one contribution of the young Marx and Engels, 170 years ago, is still unsurpassed. Although partly contained in unfinished notes, and clothed in heavily time-bound philosophical terminology, their theory of human nature as cooperative might still be really validated. Their interpretation of class society, as transitory social evolution of this nature, proves to be correct. Its restricted level of association had been coupled to scarce material conditions, just like the prognosis had claimed. In fact, it is right now that it is even becoming verifiable. The present work is aimed at restating and updating such a basic understanding.

Two other contributions of these same authors should be mentioned. Karl Marx devoted most of his life-efforts to analysing capitalism, as a transcending

culmination of class society. The transition forecasted, however, was to break through in forms that had not been prognosticated half a century earlier. Therefore, the theoretical approach of *Das Kapital* needs to be revised and updated, according to the unforeseen result. This text's opening book of the first part, on abstract capital as the independent variable of the Anthropocene crisis, is intended as a contribution to conceptualizing such a revision.

The political theory of Marx and Engels, which had mainly been conditioned by contemporary revolutionary events, and mostly produced in the form of journalistic comments, was not to stand the test of twentieth century history. Although it had certainly been rife with unerring descriptions of contemporary politics, its proposed core concept, 'dictatorship of the proletariat,' would prove to materialize as the opposite of that forecasted and intended. It turned out to be a contradiction in terms. And all efforts at amending, in theory and practice, this corrupted concept and its forecast failure, were only to make things incomparably worse, providing rationalization for the spread of the socially destructive forces producing the Anthropocene crisis. These things will take up parts within the second and third books of the first part, conceptualizing democracy and its place in social history, and twentieth century artificial restoration of bourgeois class society on historical overtime, respectively.

General consilience

Now, the conditions of the Anthropocene crisis might prove to be firmer ground for sociology. 'New evolutionary sociology' is starting to make some contributions, compatible with the understanding of the first phase transition referred to in this introduction. They are arguably substantiating the interpretation, that our progressing speciation among primates had transformed into human cooperative association through harvesting metabolism. The required scientific integration, at the critical interface of biology and sociology, seems to be burgeoning in reaction to prior failed attempts at scientific integration made by 'socio-biology' and 'evolutionary psychology.' These had still stumbled and fallen prey to biologist reductionism. A less speculative, more balanced and confirmative approach to human genesis and its implications is starting to result, utilising recent findings of cladistic analyses, comparative neuroanatomy, primate studies, and comparative habitat ecology.

But such findings, taken by themselves, lose their explanatory power, for the entire first two phases and their intermediate phase transition. Even less do they suffice for explaining the present phase transition. But the differential analysis of hominids transcending into hominins, revealing the special cooperative nature of this speciation, might of course have some bearing on *Homo sapiens*' current

return full spiral, to globally advanced circular metabolism. It might shed some light on the connection and difference between the original and the unilaterally maximized status of the species.

What remains from 'socio-biology,' that could prove suitable for recirculation, is the term 'consilience,' adopted by biologist Edward O Wilson in his second, and equally flawed, effort at re-launching the research programme of 'socio-biology,' a couple of decades further on. There might be no better designation, for conceptualizing the necessary integration process of theoretical and applied natural and social sciences into the praxis of everyday life, than ***general consilience***.

An interesting effort at generalizing the emerging integrative synthesis is the book *Transcendence: How Humans Evolved through Fire, Language, Beauty and Time* by Gaia Vince, published in 2019. She has convincingly established human nature as progressively cooperative and human intelligence as increasingly collective ('cultural bath'), consequently denouncing the myth of 'artificial intelligence.' As indicated by the book's title, the renowned popularizer of the Anthropocene thesis has taken a grip on what is changing within humanity, although the concluding chapter is meagre, vague and impressionistic. By its lack of truly integrating this general understanding of human nature with the advent of the Anthropocene crisis, the book had questionably concluded a human transcendence into an altered species – '*Homo omnis*' or '*Homni*'. The emerging reciprocity of humanity and the earth system, so brilliantly popularized separately by this author, was not to form the focus in this concluding anthropocentric thesis. Uncertainty therefore resulted. The third phase transition was thereby reduced to a concise footnote of the last chapter: "As we enter a period of global warming, with increasingly limited freshwater and mineral resources, our culture will need to transform from one that consumes water, fuels and materials to one that circulates resources within *Homni*'s global factory, ending the linear production-to-waste model we've used for the past millennia." Nevertheless, Vince's thoroughly referencing work forms an important contribution in displaying the present state of integrating science.

The meaning of life

The Anthropocene crisis has fundamentally reformulated the age-old question as to the meaning of life. It could never have been answered generally at the isolated individual level. It would therefore be both common-senseless and scientifically meaningless to insist searching general answers at that level. It does no longer

even make sense restricting it to the individual human species, in front of threatening human-induced global mass extinction. Presently it is also inconsequential at the cosmological level, unless and until life on other planets might be both discovered, understood and contacted.

At the planetary level, however, the possibility emerges to both pose the question and answer it scientifically. The anthropic principle can be formulated in a conceptually verifiable and vitally concrete sense of the term: ***The meaning of human life has become the prospect of developing abundant human relations, in saving naturally evolving life, as we know it, for the future at The Blue Planet***.

Our species, the only one capable of translating natural regularities, into information for proper interaction, has got a choice to make. Free will is only free in the meaning of choosing the right thing, in a situation where the options become so clear that it can be done, at exactly the very level of human association where the opportunity presents itself. The Anthropocene crisis presents us with a choice, that is so clear and so great, that united will needs to set free human cooperation in globally principled association. This corresponds to overall ***realization*** of human nature – in both the mental and the practically active sense of the word.

The meaning of life could or should not be posed as a predetermined matter. Such a teleological misconception might be illustrated metaphorically. Much like pre-adaptation could occur within natural evolution as random by-products (genetic drift), accompanying genetic changes immediately and actively selected for due to evolutionary advantage, only to occasionally gain a selective meaning at a later stage, humans had not been destined to take the critical position in natural history, presently produced by socio-natural co-evolution. But obviously it happened.

The result might prove a fundamental evolutionary shift – in that case probably the first global mass extinction caused by life itself, since proliferation of photosynthesis had led to mass extinction of simple anaerobic organisms, two and a half billion years ago (‘Oxygen Catastrophe’). Or, in a more conservative vein, it might prove a continuation of the 66 million years old Cenozoic era, through an Anthropocene epoch. It is definitely the first time at this planet, that a living species is presented with a real choice of such magnitude (cyanobacteria did not consider their oxy-poisonous impact, in the shallow oceans of the young Earth). If the former alternative should materialize, it would also mean the first time of missing out in this respect. Such occasions might be cosmologically rare, if not outright unique.

At exactly the moment of the Anthropocene crisis, aggregate life of one living species, humanity, is facing the option of consciously co-working, within itself and within the biogeochemical sun-fuelled work of the planetary life system, as a

united self-organizing and life-promoting global force. This could be described as a temporary and locally unique, optional socio-natural force if you will.

It could also be perceived as humanity discovering and developing its true nature. The spiritual depth of this scientific meaning, of freely choosing relatively ‘eternal life,’ will make religious superstition bleak in comparison. Humans: Mature to fill this position, as manager of The Blue Planet! That has become the meaning of life!