
TURNINGPOINTS

Atoms, Spirits and Doing Business - Rethink Materialism



Summery

In ancient Greece, the idea was conceived that atoms existed and that they were surrounded by emptiness. This idea led to the emergence of a certain understanding of human consciousness, behaviour, production, consumption and economy. The idea also led to the idea that body and spirit were separate substances of very different nature. Outside mass and emptiness, God was the only explanation. Later this paradigm developed into a thinking that the universe was mechanical and that nature consisted only of dead material. The universe became a gigantic clockwork, plants were machines, animals were machines and people were machines. This division led to the division into two 'magistrates': the church (belief) and the university (knowledge). The economy also wanted to be scientific and therefore developed a mechanical-economical theory, in which the economic laws had to be uncovered. Part of this logic meant that the laws of the economy had to be free of the same ethics that had prevailed to physics. The economy thus made itself free of values, ethics, nature, people and society. The mechanical paradigm underlying both physics,

Mathematics made it possible to predict the strength of material constructions. But could it predict the strength of the mind?

biology, psychology, sociology and economics, however, entails great explanatory problems in relation to human consciousness, memory, learning and behaviour - also economic behaviour. It could not explain consciousness, memory, language and behaviour.

Quantum physics and relativity theory prove that atoms do not exist as mass, but as energy. That atoms emerge from what quantum terms a 'vacuum'. The reality that quantum physics shows, opens up new possibilities to understand consciousness, experience, memory, language, behaviour, ethics and economics.

Some perpetual questions and problems

What do we mean when we say 'material', 'emptiness', 'consciousness', 'spirit', 'ethics' and 'God'? Can we rethink one of these without rethinking the other? I believe not. So, in this article I will try to show just how inter-related these concepts are, and how deeply they influence our identities, behaviour and consequently our economic lives too.

In the Occident we use concepts and words that go back to the Ancient Greece. These ideas were not bourn out of science and knowledge, but out of imaginations and logical thinking - these concepts still today form the core of our common language and thinking of today. This means, that we are still today perceiving the world through these antique concepts. Together they form a paradigm - the occidental paradigm. It is this paradigm's most central concepts I will present and discuss.

“Can we rethink one of these ideas without rethinking the others? I believe not.

-CLAUS KOLD

and became a part of our language. The atoms were put together in many different forms: the universe, the earth, the mountains, the plants, the animals and the human beings. Outside this atomic world there was emptiness.

The different material forms had different ways of 'behaviour', meaning or rationalities. The universe moved, the mountains stood still, but the plants grew, animals moved and even to some extent related, and the human being developed language and culture. Consequently, the question was raised: how



What is the formula for beauty?

In the beginning, the occidental philosophy had two crucial tasks - partly to create concepts for nature - the 'external' world of the human being; and partly to create concepts about the 'internal' world of the human being.

One of the most central ideas produced about the external world was the idea of the atom. The concept 'atom' is derived from 'a-' and 'tomos', which mean 'un' and 'dividable'. This way the little atoms formed a foundation under all material life

did this happen? How did human consciousness develop out of atoms? And also, from where did these atoms come?

The next big question confronting the greek philosophers was: If the world is constructed in this way, what are the consequences as to what is 'right', 'true' and 'beautiful'? What is a human being? What is society and how do we live 'good' as individual persons and together in society? Could this be deduced from our knowledge about nature or should it be deduced out of some other form?

These questions are still deeply influential to our thinking about human behaviour - and to our production of goods and services. It is so, because we mostly interpret the need of the other person or group not out of 'natural' needs, but out of cultural-social positions and habits that speak about: good, right and beautiful products or services.

The term or word 'economy' is composed of two ancient Greek words: oikos and nomos. Oikos means 'house' and nomos means 'norms' or order. The house's norms were in common with other houses, which constituted a 'fyle' - a social layer. This social structure composed a 'Polis' - a city state with a hinterland. In this way, the idea of the social, of politics - about 'right' and 'regulation' arose. Thus, economics deals partly with, who are the 'we' of the house, and partly with what rules will 'we' live by in the house - what ethics would govern our behaviour?

The term "ethics" is derived from the Greek concept of 'ethos', which means 'custom'. Habits or customs form part of the human character and behaviour - and thus influence every day consumption. Ethics is therefore central, important and inevitable when we reflect over our every-day life and our values, as they often influence in our different life-choices.

Aristotle was one of the first to formulate an actual ethical reflection. He did this in his book, 'Ethics', where he writes about the emergence of human customs and the continued development of the human being. Ethics was the doctrine of how to create a character, so that one could develop good virtues. Aristotle pointed to the importance of education for the development of ethics and virtues. However, ethics include far more than upbringing and education. Aristotle, therefore, also emphasised that human beings must learn from their experience in order to form an ethics. Thus, our every-day habits must create 'a good' character associated with the 'good actions'.

We first hear about the concept of 'morality' in the writings of Cicero, where he translates the Greek 'ethos' into 'moralis', which comes from 'mores' that mean 'habit' or 'custom' in Latin. Ethics and morals therefor historically have somewhat the same meaning. Nevertheless, a distinction is made between ethics and morality, referring to a difference in reflective level between the two, where ethics is the philosophical-theoretical basis of morality and morality is the more practical implementation of ethics in concrete actions.

This ought to show us, that it is not possible to change ideas without also including other ideas and also the practical reflected and un-reflected actions in our every-day life. The ideas, concepts and language we have about 'matter', 'life', 'reason' and 'action' are the very stories that govern our actions and our well-being, whether we are happy or sad about it in our lives. Learning processes, conversations, guidance and work are inevitably and deeply intertwined with ethics and moral - with how and why we share our world and our culture with others.

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Matter, Emptiness and Spirit

The most central problem to the presocratic philosophy was to establish a social order by pushing the power of nature back.¹ This was done partly in the ontological nature-philosophy. The central question of this period was: what is *Physis*?

In the first philosophical thinking, *Physis* was described as ‘That’ which ‘was’, ‘equanimity’ or ‘immobility’ – as opposed to the changing processes of lived life. This focus produced a logical problem, because if *Physis* was one, what then is ‘movement’, ‘change’ and ‘development’?

The most dominating symbol to presocratic thinking regarding this *Physis* was the *Sphaira* – the sphere, which to Pythagoras (o. 580 - 500 B.C.) symbolised the Earth and the form of the Universe. By Empedocles (o. 483 - 424 B.C.) the symbol expressed an implicit godly form, and by Heraclitus (o. 535 - 470 B.C.) a rotating Yin Yang globe of light and darkness, creation and death.² Heraclitus thought that all is in perpetual change. He believed, that the world was constantly being created as a result of the dynamic and cyclical binary action between opposing pairs that would constitutes one unit.³ Because of this he regarded every pair of opposing forces as a unit, which transcended all opposing forces. This unit he termed *Logos*.⁴

“To Parmenides (o. 475 B.C.) the *Sphaira* symbolised the knowledge about the constant being, through which reason could be reached, once the deceptive world of the senses was realised.”⁵ Thus, Parmenides has been known for the formulation that there are two ways of being: that which *is*, that which *is not*. He stated, that the latter is not possible because nothing can *not be*.

Parmenides claimed that, in a world of sensing, truth cannot be known through sensory perception because the opposing units are in constant interaction.⁶ Therefore, Parmenides thought that real change was impossible. The changes, which human beings perceive in the world, are produced by the senses themselves, and are thus only illusions. Only pure reason (*Logos*) will result in the understanding of the truth of the world. The human perception of things or appearances (*the doxa*) is deceptive. We may see, for example, tables being made from wood and then destroyed, and speak of birth and demise; this belongs to the superficial world of movement and change. But this genesis-and-destruction, Parmenides emphasises, is illusory, because the underlying material of which the table is made will still exist after its destruction. What exists must always exist. And we arrive at the knowledge of this underlying, static, and eternal reality (*aletheia*) through reasoning, not through sense-perception. According to Aristotle, this was what led the philosophers from Milet, Leucippus and his student, Democritus to propose his atomic theory, which supposed that everything in the universe is either atoms or nothingness.⁷

Parmenides’ transcendence of Heraclitus’ visible-sensed world with its eternal dynamic principle of binary opposing pairs led him to an idea about a pre-existing, invisible being consisting only in thought and without motion in complete harmony. The possibility for such transcendence and such a synthesis already existed by Heraclitus, when he termed the way up and down as ‘one and the same’ ‘good and evil as one’. The binary oppositions must originate from a fundamental unity, when they can behave self-regulating in the world of creation. This fundamental ‘unity’ is the un-created world,

¹ Jürgen Habermas, 1981, p. 1

² Johannes Fabricius, 1965, p. 52

³ Johannes Fabricius, 1965; Fritjof Capra, 1975

⁴ Johannes Fabricius, 1965; Fritjof Capra, 1975

⁵ Johannes Fabricius, 1965, p. 52

⁶ Johannes Fabricius, 1965, p. 52

⁷ Ole Thyssen, 1981, p. 252



The smell of the dire strait you walk, is it a good smell or a bad smell? And why is it so?

or the world of thought, where, as Parmenides says, 'the thinking and the being is one and the same'.⁸ This way, in classical Greek thinking, consciousness and rationality were perceived as a superior principle that gave reality order, structure and meaning.

The sensing and thinking of the human being was but one among many other things in this all-embracing logos which gave meaning to the rationality in the human being.

This way the *'place'* for human consciousness and thinking came to be placed *'outside'* the human being itself – in a *meta*-physics. This place, this cosmological meta-physical rationality was universal, and was represented first by more gods, later by a single *God*.

God, Angels and Spirits

Gradually this binary or dual thinking about matter and spirit produced the necessary existence of one divine principle, transcending all gods. This principle was considered to be the same as or equal with the unity of the universe.⁹ Later this thinking merged with a belief in a God, which gradually got the shape of a person, an intelligent father, who was placed outside the world and from this outside

ruled the world.¹⁰ Thus, the division in *matter* and *nothingness* is the place of conception to the occidental understanding of God as something separated from matter; an idea, which also led to the division of the world into two separate substances: living spirit and dead matter.

Leucippus and his student Democritus developed the big colourless sphere of Parmenides into an atomic theory.¹¹ In this theory the world consisted of small atoms, which would be hard, colourless and unchangeable pieces of unbreakable dead matter. This atomic theory, however, also had to explain how the human consciousness, mind, experience, memory and learning could be understood in these contemplations about matter, space and causality?

The inclusion of the human being in this theory of a physical world was done by linking subjectivity and feelings to so-called 'spirit-atoms', which were supposed to be especially fine atoms consisting of matter. This could be perceived as a forerunner to the chemical-biologic explanations to human behaviour. These very small and fine atoms were supposed to move all over and build unique constellations. Doing so, they created the individual soul. In

⁸ Johannes Fabricius, 1965: 50f

⁹ Fritjof Capra, 1975

¹⁰ Erich Fromm, 1956

¹¹ Ole Thyssen, 1981, p. 252

this thinking matter consisted of completely passive, isolated and dead particles (objects), which were moving in an empty space. All that existed beside the atoms and spirit-atoms was excluded as *subjectivity*.

Subjectivity was seen as the produce that come from taste, smell, sight, hearing and skin sensing. These subjective senses were unreal or subjective in an empty space in which only atoms could move. The question was how a randomly pile of atoms could produce something of a completely different nature - consciousness, memory, thoughts, learning, identity, meaning and taste – not to mention change (age) and development (experience).

At the end of the day, the piling-up of atoms which led to whole forms such as for instance mountains, trees, cows and human beings; and the actions of these forms could not be explained, but was explained by 'external' and *un-understood forces* of a spiritual character, a *God*.

The Birth of a Mechanical Universe

So, outside the universe of atomic matter and emptiness, a spiritual God came be the only explanation left of 'consciousness' and 'mind'. This construct eventually led to a belief that the universe was set in motion by this God, who would later leave it with its eternal energies, forces and laws.

Up through the Middle Ages, scientific thinking, methodology and analysis were more or less laying still under the influence of the church. Science and philosophy were not free, and was mainly tasked to verify and ensure the church's truths rationally.¹² For example, the objective of the Bible-hermeneutic interpretation was to confirm the views of the church rather than to criticise and perhaps rethink the Christian teaching.¹³

“God came be the only explanation of ‘consciousness’ and ‘mind’

Not until late in the 15th century, physical experiments again began to be carried out to verify speculative hypotheses of science. This led to new scientific theories, which were based on experiments and formulated in mathematical language. The combination of empirical knowledge and mathematics thus stands for the breakthrough of modern science.

The period is called 'Anni Mirabile' - those wonderful years, and here the groundwork is laid for what today is called classical physics. A physics, which not without struggles with the church turned upside down a teleological worldview. The new classical physics bolstered the groundwork for considering the world as a big mechanical clockwork, which – after it was first started by God - could continue to run infinitely, because the parts had been connected, not the final causes, but by efficient causal relations.

Where the classic science dealt with a classification of things with regard to God-given permanent positions, the consequence of the new efficient dominated world was a focus on functions, interactions between the single cogs in the mighty clockwork, the universe. The ideal of experimental cognition had resurrected: "... when the truth can no longer be held dogmatically from the top (of a Will), it must be supported empirically (through thousands of observations)." ¹⁴

The value of knowledge was demonstrated through methodically conducted experiments, which produced empirical data, without reference to a God or a telos. The new classical physics affected a shift from a static, teleological world-view dominated by phronesis (intuition) and causa-finalis

¹² Ole Thyssen, 1981

¹³ Jesper Gulddal & Martin Møller, 1999, p. 15

¹⁴ Margaretha Bertilsson in Andersen, Heine & Lars Bo Kaspersen, 2000, p. 545

(technical knowledge) to a dynamic world view in which science would explain change: how things start, develop and disintegrate.¹⁵

The new classical physics and natural cognition of the renaissance were crucial for philosophy. In 1543 Copernicus' published 'De Revolutionibus Orbium Coelestium' (circulation of celestial movements). Copernicus believed that nature had to be simple, and for the sake of description he put something physically in the center, namely the sun. The courage to describe the earth as a circulating planet Copernicus got from reading the ancient Greek philosophers who had similar ideas.¹⁶ This idea broke ground with the contemporary world to such a degree that it took name from Copernicus: 'a Copernican reversal'.

The monk Bruno expanded Copernicus' world-view, but denied that the sun could be the focal point: there is no center, space is infinite, he argued: no matter how far an archer shoots, he can always shoot an arrow farther. This made positions and provisions as 'up' and 'down' relative. With this argument Bruno broke with Aristotle's cosmology, which for ages had set the agenda for the ancient and medieval world.

Although Bruno legitimised the infinity of space from the idea of God's infinity, his worldview turned upside down the worldview of the rulers. If the Earth (and God) no longer is the world's center, it could no longer be the final force and all things' aim were called into question.¹⁷ Bruno's provocative statements would later form the basis for a new God-less view on science. This development also influenced the social sciences, because it is only when human's actions do not follow a pre-given, divine plan, that it will be interesting and necessary to examine why and how people act as they do.

God as a metaphysical 'reference point' had been used to justify the laws of physics. And God had also been used to justify human actions and social structures. Religion had hitherto dominated science, philosophy and art.¹⁸ The result was that human acts were unreflected, and were explained out of traditional and charismatic arguments.

However, even if this development took place, up until the seventeenth century, university scholars and Christian theologians in general taught that the universe was alive, pervaded by the Spirit of God, the divine breath of life. They also taught that all plants, animals and people had souls. In the greater



How many tonnes of 'meaning' does this escalator carry every day?

¹⁵ Lund, Erik, Mogens Phil og Johannes Sløk, 1962, pp. 226-7

¹⁶ Kirsten Hastrup, 1999, p. 13

¹⁷ Margaretha Bertilsson in Andersen, Heine & Lars Bo Kaspersen, 2000, p. 545

¹⁸ Jürgen Habermas, 1984; Agnes Heller, 1999

universe, the stars, the planets and the earth were also living beings, guided by angelic intelligences.

As the new physics developed momentum, the mechanistic science would reject these religious doctrines and expel all the souls from this natural-mechanical-scientific world. As a consequence material world became a soulless machine. Matter became purposeless and unconscious; the planets and stars were dead places. In the whole physical universe, the only non-mechanical entities were the human minds, which were immaterial, and part of the spiritual world that included angels and God. No one could explain how minds related to this machinery of human bodies, but as described earlier, René Descartes speculated that they interacted in the pineal gland, the small pine-cone-shaped organ nestled between the right and left hemispheres near the centre of the brain.¹⁹

After some famous and initial conflicts, most notably the trial of Galileo by the Roman Inquisition in 1633, science and Christianity became increasingly to represent two different life-spheres by mutual consent. “Science’s domain was the material universe, including human bodies, animals, plants, stars and planets. Religion’s realm was spiritual: God, angels, spirits and human souls.”²⁰

The magisterium of science covers ‘the empirical realm: What the Universe is of (fact) and why does it work in this way (theory). The magisterium of religion extends over questions of ultimate meaning and moral value.

These positions were accepted until the time of the French Revolution (1789-99), when materialist thinkers started to rejected the principle of the dual magisteria. They could only recognise one reality; the material world, and claimed that the ‘spiritual realm’ did not exist. So, Gods, angels and spirits were products of human superstition, and the human mind was nothing by-products of brain activity. To them, there was only one magisterium; the magisterium of science - material science.²¹

A Mighty Clockwork

As shown, the departing point for modern science was the gradual rejection of the organic view of the universe. The clock and the machine metaphors became central to scientific thinking, with very far-reaching cultural, social and economic consequences.

Before the 17th century, the belief that the universe was like an organism was widely followed; nature was alive, and so was the earth. “Leonardo da Vinci (1452-1519), for example, said: “We can say that the earth has a vegetative soul, and that its flesh is the land, its bones are the structure of the rocks . . . its breathing and its pulse are the ebb and flow of the sea?” William Gilbert (1540-1603), a researcher into magnetism, said about his organic philosophy of nature: ‘We consider that the whole universe is animated, and that all the globes, all the stars, and also the noble earth have been governed since the beginning by their own appointed souls and have the motives of self-conservation.’ Even Nicholas Copernicus, whose revolutionary theory of the movement of the heavens, published in 1543, placed the sun at the centre rather than the earth was no mechanist. His reasons for making this change were mystical as well as scientific. He thought a central position dignified the sun:

“Not unfittingly do some call it the light of the world, others the soul, still others the governor. Tremigstus calls it the visible God: Sophocles’ Electra, the All-seer. And in fact does the sun, seated on his royal throne, guide his family of planets as they circle around him.”

Copernicus’s revolution of this cosmology was a powerful stimulus for the subsequent development of physics. For centuries, there had already been mechanical models of some aspects of nature. But

¹⁹ Rupert Sheldrake, 2013, p. 21

²⁰ Rupert Sheldrake, 2013, p. 21

²¹ Rupert Sheldrake, 2013, p. 22



**Does everything
produced by human
hand come with a
meaning?**

the shift to the mechanical theory of nature which started after 1600 was much more radical.”²²

Already in 1605, Johannes Kepler referred to his programme with these words: “My aim is to show that the celestial machine is to be likened not to a divine organism but rather to a clockwork ... Moreover I show how this physical conception is to be presented through calculation and geometry.” Galileo Galilei (1564-1642) agreed that ‘inexorable, immutable’ mathematical laws ruled everything.²³

The clock-work metaphor was very persuasive as clocks work in a self-contained way and are not being pushed or pulled by external objects. This was seen to resemble the universe, which worked without being pushed or pulled. The clock-work metaphor had another advantage: they were excellent examples of what knowledge could produce. This kind of mechanical knowledge became power and soon dominated all the faculties at the European universities.

Thus, the high status of the natural-mechanistic science did not come from the philosophical thinking, but from what it produced. The physical-mathematical modelling could produce easy to realise, man-made machines or objects. Therefore, mathematical mechanics became

visible and impressively useful in every day life, dealing with relatively simple and practical problems, such as the building of a new type of houses, transport, communication - and warfare.

Even if this new mechanical reality was seductive because of its powerful usefulness, it was only one level or dimension of ‘reality’. And as such, only a very simple one:

“One paradigmatic example is billiard ball physics, which gives a clear account of impacts and collisions by idealised billiard balls in a frictionless environment. Not only is the mathematics simplified, but billiard balls themselves are a very simplified system. The balls are made as round as possible and the table as flat as possible, and there are uniform rubber cushions at the sides of the table, unlike any natural environment. Think of a rock falling down a mountainside for comparison. Moreover, in the real World, billiard balls collide and bounce off each other in games, but the rules of the game and the skills and motives of the players are outside the scope of physics. The mathematical analysis of the balls’ behaviour is an extreme abstraction.”²⁴

²² Rupert Sheldrake, 2013, p. 28

²³ Rupert Sheldrake, 2013, p. 29

²⁴ Rupert Sheldrake, 2013, p. 30

This new mechanical-scientific development took place at the same time as the destructive religious wars were fought in the seventeenth-century Europe. Some philosophers, scientists and visionary politicians saw this mechanical-mathematical-natural physics as a way to transcend the religious conflicts, if it could reveal eternal truths as facts and proofs. According to this understanding, the pioneers of mechanistic science were finding a new way of understanding the relationship between Nature and God. This placed the mathematicians in a God-like position, rising above the limitations of ordinary human minds and bodies.²⁵ Galileo expressed it like this:

“When God produces the world, he produces a thoroughly mathematical structure that obeys the laws of number, geometrical figure and quantitative function. Nature is an embodied mathematical system.”²⁶

However, the same old fundamental problems were not solved: human beings have feelings, like music, eat things they especially like, “enjoy the beauty of flowers, laugh at jokes. In order to assert the primacy of mathematics, Galileo and his successors had to distinguish between what they called ‘primary qualities’, which could be described mathematically, such as motion, size and weight, and ‘secondary qualities’, like colour and smell, which were subjective. ‘They took the real world to be objective, quantitative and mathematical. Personal experience in the lived world - the organised and economical world - was subjective, the realm of opinion and illusion, outside the realm of science. René Descartes (1596-1650) was the principal proponent of the mechanical or mechanistic philosophy of nature. It first came to him in a vision on 10 November 1619 when he was ‘filled with enthusiasm and discovered the foundations of a marvellous science. He saw the entire universe as a mathematical system, and later envisaged vast vortices of swirling subtle matter, the aether carrying around the planets in their orbits.’²⁷

“Nature is an embodied mathematical system.”

Descartes took the mechanical metaphor much further than Kepler or Galileo by extending it into the realm of life. Just as Kepler projected the image of man-made machinery onto the cosmos, Descartes projected it onto animals. These animals, too, he claimed, were like clockworks. Their activities such as the beating of the dog’s heart, its digestion and breathing - they were all programmed mechanisms. The same principles applied to the bodies of the human being. Today, we have become so used to the machine theory of life that it is hard to understand just how radical a break Descartes made:

“From the Middle Ages right up into the seventeenth century, the prevailing theory of life taught in the universities of Europe followed the Greek philosopher Aristotle and his leading Christian interpreter, Thomas Aquinas (c. 1225-74), according to whom the matter in plant or animal bodies was shaped by the organisms’ souls. For Aquinas, the soul was the form of the body. The soul acted like an invisible mould that shaped the plant or the animal as it grew and attracted it towards its mature form. The souls of animals and plants were natural, not supernatural.”²⁸

In a way, the radical break by Descartes, just made it even harder to understand ‘matter’ and ‘life’, as they too became ‘radicalised’ opposite positions. Descartes was a rationalist in his thinking, and used

²⁵ Rupert Sheldrake, 2013, p. 31

²⁶ Rupert Sheldrake, 2013, p. 31

²⁷ Rupert Sheldrake, 2013, p. 31

²⁸ Rupert Sheldrake, 2013, p. 33

the logical deductive method to take the concepts and sentences 'apart', to see what they were composed of, and to see if they could be 'put' it together again. If this went without problems, the argument was good and accepted. However, Descartes was facing the same problem as Plato; the problem of how to connect the thinking 'mind' to a mechanical 'body'. To this problem, others took to the thinking of Descartes the same position as Aristotle took to Plato.

The modern empiricism

The development of empiricism was a reaction to the rationalism of Descartes - their common problem was matter and spirit. The development of rationalism can be said to comprise of two phases: a first 'deconstructing' phase, which in the form of the English empiricism sought to locate the 'place' for cognition of the single individual's experience. The English period of british empiricism goes from John Locke (1632-1704) to David Hume (1711-1776).

Second phase of this development comprises of the German idealism, which let the mind, the 'ego' prescribe or construct nature's regularity. The period of German idealism goes from Kant (1724-1804), over Fichte and Schelling to Hegel (1770-1831).²⁹

The british empiricism was marked by a mechanical definition of the universe, which paved the way for a still more radical division of the subject object division, which eventually would end up in the perception that epistemology (discourse of the spirit) was completely separated from the ontology (matter, the thing, the essence) and at the same time philosophy and social sciences could be separated from the necessity of the 'place' outside everything (God or substance).

The starting point of John Locke was to try to be more precise about the concepts people use when they relate to the foundation of any sensing which the new liberal individual 'I' would carry out. With Locke the empirical evidence of human consciousness consisted of 'ideas'.

According to Locke, the substance exists behind what human perception can perceive through its senses. This means that human beings cannot have ideas of substance, only ideas about ideas. As a consequence, Locke thought that consciousness and the unity of consciousness had to do with 'a soul entity' somewhere behind the ever-changing perceptions.

Locke's central idea was that human consciousness had a capacity to absorb the experience through reflection. All material in human experience comes from sensed experiences, he thought. Hereby Locke takes a leap from ontology to epistemology.

The fact that Locke changed his focus from the foundation of cognition to the ideas or concepts, through which human beings perceive the world, marked a philosophical shift from an epistemology of what is, to an epistemological analysis of concepts - from analysis of things to the analysis of ideas.

Locke's interest in the human capacity for perception showed an interest in human nature, which no longer is a part of God. According to Locke, the human consciousness is from the beginning empty - a 'tabula rasa' on which the experience of life writes its own individual history. This way consciousness is added both a history and a technique by which it becomes possible to control the perception and thus shape the development of consciousness. Here we see one of the first theories about the human learning proces.³⁰

In his construction, John Locke rejects the rationalist claim that the human being is born with innate ideas. Ideas are the result of experience, which forms human beings. This is crucial for the perception of human beings: consciousness is something that can be actively shaped and formed, and thus human beings do not from birth have an identity through blood or lineage.³¹ 'There is nothing in

²⁹ Ole Thyssen, 1981

³⁰ Ole Thyssen, 1981, p. 87

³¹ Ole Thyssen, 1981, p. 87

the soul which has not first gone through the senses', argues Locke.³²

This, re-activated the old philosophical questions about the foundation and unity of this consciousness. For if the soul does not exist in advance what physical entity ensures the unity of all the senses? Where is the 'substance' behind the many changing ideas that fill the person's consciousness?

In order to maintain the unity of the conscious mind and avoid that it is dissolved in a bunch of scattered sensations Locke regressed to the place behind human senses, to the safe metaphysical God. Locke's work thus marks an unfinished confrontation with Plato and Aristotle's epistemology.

Locke's design, however, changed the human position from having been embedded in a cosmology, where its position was collectively justified and where its acts were collectively justified in a reference to God, traditions and norms; to a situation where human beings must individually create their own individual identity.

The empirical skepticism marks the final collapse of the traditional philosophy of consciousness. Locke constructed a philosophical thinking, where all knowledge derived from perception, and he rejected the ideas of innate ideas, but nevertheless accepted the idea of a material substance. The philosopher, Berkeley deconstructed the materialistic idea of substance, but it was especially Hume, who dissolved the metaphysical place of rationality. From Descartes and Locke, Hume adapted the absolute division between spirit and body and the concept of sensory experience, where experience is the sum of the remembered experiences in consciousness. Hume's consistent conclusions suggested that this notion of human subjectivity made it impossible for the human being to produce an objective cognition. With Hume there was nothing more than a scattered piecemeal sensations left, which could gather in an 'I', a soul. However there was no place behind or outside of human perception or consciousness, which could justify this.

The ancient dualism was, in the thinking of Hume, still unresolved. The problem is that the object is being sensed, and therefore exposed to the terms of the senses. With this insight the Kantian problem is inevitable.

Kant's Attempt to Mediate Mind and Body

Kant's philosophical project was a critique of the empirical philosophy, i.e. a critique of Locke, but especially a criticism of Hume, who almost made the human experience impossible.



Plato might have liked this photo?

³² Will Durant, 1973, p. 156

In Kant's philosophy the a priori experience includes two tools that reason uses: this becomes evident in the distinction between understanding as the general concept, 'verstehen', and the understanding as a faculty of the human mind, 'verstand'. In English language, the word understanding is usually used in both senses.

A Prerequisite of Kant's philosophical construction was that the 'ego', could not at the same time both be a part of the contents of consciousness and be something separate from the contents of consciousness. The 'ego' was a prerequisite for consciousness, memory and cognition, and therefore it was necessary that this was consistent over time.

Thus, Kant must explore the human conditions for sensing and experiencing, but he does not believe that he is able to investigate and to relate to what that 'something' is. Matter or 'Das Ding an Sich' he leaves as a problem for posterity.

Kant's construction had a mediating character, since it consists of both a rational and an empirical understanding of the philosophical systems. In a way, one can therefore say that Kant with his design attempts to reconcile the positions of Plato and Aristotle, and to get both to work together.

On the one hand Kant asserts that a human being cannot perceive and think without language and concepts. Logically the argument contains the claim that there is a strong correlation between the sensed and the sensing, and that this relation is reflected in language. That recognition is given prior to the experience Kant termed, 'a priori'.

On the other hand, Kant believed that the human being recognises or senses 'something' and that all knowledge comes from experience. This sensory-based experience, he called 'a posteriori'.

The terms a posteriori and a priori are then used to distinguish two types of knowledge: a priori knowledge is independent of experience; contrary to a posteriori knowledge, which is dependent on experience. So, in Kant's construction the human being has an experience, which is not based on the senses and another, which is.

A Kantian 'category' is the appearance of 'an object in general', before it has been experienced. Kant wrote that he wanted to produce " ... a word of explanation in regard to the categories. They are concepts of an object in general..."³³ Categories are entirely different from the appearances of objects. According to Kant, in order to relate to specific phenomena, categories must be applied through time. The way that this is done is by Kant termed 'a Schema'.

Kant states, " ... it is quite possible that our empirical knowledge is a compound of that, which we receive through impressions, and that which the faculty of cognition supplies from itself (sensuous impressions giving merely the occasion)." ³⁴

So, contrary to Locke and Hume, Kant thought that a priori knowledge is independent of the content of experience; and further on, unlike the rationalists, Kant thinks that a priori knowledge, in its pure form, without the admixture of any empirical content, is knowledge limited to the deduction of the conditions of possible experience.

The a priori conditions are seated in the human being's cognitive faculties and not provided by experience in general or any experience in particular. Said differently: space and time only applies to the human being and not to things. It is the human being who, in its sensing creates the external world, time and space. But all things have a place in time and space, and consequently laws can be constructed, which necessarily applies to all sensations. It is mathematics that deals with these laws, which thus pre-apply all our experience. Because they apply in advance Kant term them a priori.

“The recognition given prior to the experience Kant termed, ‘a priori’.”

³³ Immanuel Kant, 1999, Introduction

³⁴ Immanuel Kant, 1999, Introduction

With Kant's construction philosophy changes from a direct observation of the external world (positivism) into an observation of the human being's internal-conceptual world, epistemology, into Kant's understanding of the meaning of philosophy. This analysis of the internal world of thought, Kant termed 'the analysis of the transcendental logic', because it is an analysis of consciousness' ability to be consistent and think coherent over time.

Kant argued that there were 12 faculties of understanding, which consciousness used for thinking. The a priori conditions could not be transferred to the world, which is 'outside' the human consciousness. The a priori conditions are used by human beings to shape experience for it to become a human experience. The a priori conditions organises observations into categories thus transforming them to knowledge.³⁵

The Possibility of Human Experience

At this point, we can ask how Kant believed to propitiate rational philosophy with empirical data? And how is it would be possible to extend the experience and knowledge, if it doesn't happen through experience? Is the human being hopelessly isolated in its own rational concepts about the world?

The answer to this lies in Kant's work with the approaches to human cognition, a priori and a posteriori. These two approaches to cognition were, Kant believed, respectively analytic and synthetic.

All a priori knowledge are analytic, because of its inner logic, for instance: the fact that bachelors are unmarried, is not produced by experience. This is done through an analysis of the concept.

And all a posteriori are synthetic, because one cannot in advance know for example that objects have gravity. It is something one finds out through experience.

But there are, according to Kant, insights that are *both* synthetic *and* a priori, and this is where Kant perceives a glimpse of the possibility of reconciliation between empiricism and rationalism. An example of this could be the argument, that the straight line between two points is the shortest. Hereby Kant refutes Hume's postulate.

If there only existed analytic a priori and synthetic a posteriori statements, the consequence would be what Hume outlined, namely a denial of the possibility of cognition, the skepticism that we find in Hume.

Kant's design fundamentally changed the way philosophy perceived of the human subject's relation to the objects in the world. With Kant's construction, this relation was changed to consist of a relation between a present thinking and a thinking that had already taken place. If I understand Kant correctly, a society consists of old and accepted concepts through which the human beings perceive in the present. Their present acts (interpretations) challenge the old and accepted concepts, which are then developed into new understandings.

All these processes, however, take place 'inside' an epistemological human social world, and thus without claims about an external reality and 'natural' objectivity. What remains is still the problem of getting hold of matter and the place for consciousness and all this thinking. This still stands unresolved...

Dualistic Positions

Now, even if the founders of this European philosophy disagreed about where to start their inquiries, they all agreed about other fundamental ideas; the idea that matter existed in an empty space, and that this matter was created by an omnipotent God. However, as I keep showing - sorry for all the repetitions - it was this division which, in the first place, created the problem of how to explain human consciousness, memory, learning and development.

³⁵ Justus Hartnack, 1979, p. 35f

Before this mechanistic revolution, there were three levels of explanation: bodies, souls and spirits. Bodies and souls were part of nature. Spirits were non-material, but interacted with embodied beings through their souls. The human spirit, or 'rational soul', according to Christian theology, was potentially open to the Spirit Of God.

After the mechanistic revolution, there were only two levels of explanation: bodies and spirits. The three layers were reduced to two by removing souls from nature, leaving only the human 'rational soul' or spirit. The abolition of souls also separated humanity from all other animals, which became inanimate machines. The 'rational soul' of the human being was like an immaterial ghost in the machinery of the human body.

This still left the fundamental question unanswered: How could the rational soul possibly interact with the brain? As we have seen, Descartes speculated that their interaction occurred in the pineal gland. He thought of the soul as a little man inside the pineal gland controlling the plumbing of the brain. He compared the nerves to water pipes, the cavities in the brain to storage tanks, the muscles to mechanical springs, and breathing to the movements of a clock. The organs of the body were like the automata in seventeenth-century water gardens, and the immaterial man within was like the fountain keeper:

"External objects, which by their mere presence stimulate [the body's] sense organs ... are like visitors who enter the grottoes of these fountains and unwittingly cause the movements which take place before their eyes. For they cannot enter without stepping on certain tiles which are so arranged that if, for example, they approach a Diana who is bathing they will cause her to hide in the reeds. And finally, when a rational soul is present in this machine it will have its principal seat in the brain, and reside there like the fountain keeper who must be stationed at the tanks to which the fountains pipes return if he wants to produce, or prevent, or change their movements in some way." ³⁶

The final step in the mechanistic revolution was to reduce two levels of explanation to one. Instead of a duality of matter and mind, there was to be only matter.

This is the doctrine of materialism, which has come to dominate scientific thinking in the second half of the nineteenth century.

The Impossibility of the Mechanical Society

This transformation towards a rational and analytic perception of the world, has by the social sciences been given several names and explanations. By the sociologist Max Weber it has been termed the 'entsauberung' - the disenchantment - of the religious understanding of the world.³⁷ Horkheimer and Adorno, later discussed this disenchantment of the world. They called the development 'a development from Mythos to Logos'.³⁸ In Weber's examination the social rationalisation he identified the development of a 'purposively rationality' [zweckrationalität], which he defined as the dominating rationality in the modern capitalist society. Weber's analysis resulted in a rather pessimistic diagnosis, which, in the thinking of the later Horkheimer and Adorno is almost without hope for humankind. The younger sociologist Jürgen Habermas criticises Weber for putting too much emphasis on the purposively rationality in his analysis. Habermas thinks this gives Weber a too narrow perspective. The idea of Habermas is that social cohesion (rationality) originally could be found in rite and religion. Thus Habermas claims, that the main tendency of the rationalisation is that the 'sacral' (God) is

³⁶ René Descartes, in Rupert Sheldrake, 2013, p. 34

³⁷ Max Weber, 1922; Habermas, 1981, p. 187

³⁸ Max Horkheimer & Theodor W. Adorno, [1944] 1993



How is it possible to enjoy foreign beauty, if we don't come from the same culture?

gradually 'de-mythologized'.³⁹ This happens as God is transformed into linguistic concepts and thereby being reflected - discussed, doubted and turned into values, goals and every day life tasks (economy) and rationalities - by human beings. This develops the thinking, ideas and language, which, results in an external differentiated *life-world* that forms the base of the communicative act.

How is Society Possible?

Without God and poised in a dead universe, Georg Simmel found it timely to formulate his famous question: 'How is society possible?', thus indicating that something completely new had happened. The birth of modernity formed the ground for an entirely new understanding of 'science' - both the natural and social sciences; for when human actions are set free and not told to follow a pre-given divine order it becomes necessary to examine the motives and structures of the (new) social order. Thus, social theory was established the very moment when the mass of people became visible to scientific theory: their many and disparate efforts (economical factors and forces?) led to the production and reproduction of society.

This process, Jürgen Habermas includes in 'the human articulation of the Divine', separated the Divine into the ancient three different systems of rationality: the Good, the Beautiful and the True. These different systems of rationalities resulted, according to Max Weber, in different systems of human objectifications, each with its own rationalities and human action.

With God's death and the entry of mechanical science the discourse simultaneously changed from one of understanding to one of explaining. There was no spirit 'in there' to understand - the body-machine, however had to be explained. In the explanation of society and its sub-organisations, social order (cohesion) became a central concept. How is it possible, that human beings understand each other and are able to coordinate their actions, without a coordinating God? In order to explain this 'new' need for social cohesion, it was also necessary to define what social data was, leading to the logical question of where social data is to be observed or obtained from? Is there a place 'outside' society and cultural concepts?

The discussion regarding what society is, and from where it is to be observed is, however, not a new and modern one. These two closely related research questions are as profound as they are fundamental. Again, in its philosophical forms the discussion started between Plato and Aristotle as they represented two ways of thinking about the social organisation: the rational and the empirical, which also used different starting points, respectively, in

³⁹ Jürgen Habermas, 1981

form, which uses rational concepts (logos) and in flux which uses empirical data (sensory data).

Plato argued for a deductive method, believing that perception of the ever changing flux could not take place without constant concepts. He also argued that the forms which human beings see are not real, but literally mimic. To understand this, the English word form must be seen as the two distinct with which Plato was concerned – the external form or thing, and form as ideas, not as the material world of change, known to human beings through its sensation. To Plato, the forms as ideas are the only constant and coherent objects of study that can produce valid knowledge.

Aristotle turned the argument of Plato completely around. As we have already seen, to Aristotle, cognition started in the sensing and not in the thinking; for nobody ever saw 'a banker' because such a concept arose from thinking, it is not something real. What could be perceived was always the specific, 'Hans' who is a banker. Thus Aristotle argued that it was the specific, that is, 'Hans' and 'Peter' and 'Dan' who should be inductively observed in order to accumulate enough evidence to form the concept: 'banker'. The sensory impressions are reflected in the human psyche, and are through repetition transformed into memory, and from here formed into the experience, which Aristotle terms *empeiria*. From this he concludes that there is nothing in experience which has not previously been sensed.

A similar discussion as the one between Plato and Aristotle later reappeared with the rationalist philosopher Descartes and the empiricist philosopher Locke.

These different notions of the perception of the natural world also influenced the idea of how to observe the cultural world, society. Here, a fundamental discussion is found in the two books of Aristotle, the 'Nicomachean Ethics'⁴⁰ and 'Politics'.⁴¹ In the two books Aristotle constructed two different theories about human action.

The Nicomachean Ethics focuses on the single person's intentional actions,⁴² whereas Politics focuses on the socially organised role's expressive actions.⁴³ Aristotle did so by describing the virtues motivating the single person's intentional actions as constructed by the short private history of the person, whereas he used the organised functional actions of a sailor in a boat to describe the expressive actions of the role with all its historically developed special functions.

The philosophical construction of Aristotle led Weber to his theory that society could be understood as the sum of all intended actions, thus focusing on the intentional behaviour of the individual, whereas Durkheim supported the theory that society was more than the sum of all actions, thus focusing on behaviour as an expression of the roles and functions of society and organisations.⁴⁴

This fundamental discussion on the factors behind the rationalisation of social order is underlying all sociological theories. In Comte, we find an incipient formation of the collective;⁴⁵ Tönnies shows a difference between the organisation based on 'Gemeinschaft' and the organisation based on 'Gesellschaft';⁴⁶ Durkheim posited a similar development from an archaic 'mechanical solidarity' to a modern 'organic solidarity'.⁴⁷ With Elias we find a historical review of exhaustive detail of how everyday customs and habits are changing, with changes in both every-day life and the use of material

⁴⁰ Aristoteles, 2000

⁴¹ Aristoteles, 1999

⁴² Aristoteles, 2000, p. 73

⁴³ Aristoteles, 1999, p. 151

⁴⁴ Kaspersen, 1995, p. 49

⁴⁵ Stuart Jones, 1998

⁴⁶ Jose Harris, 2001

⁴⁷ Segal in Buck, 1981, p. 42

tools in relation to violence, power, and organisation. Through his analysis, Elias reaches a concept of 'chains of interdependency' that creates coherence between the individual and the 'external world', things and society.⁴⁸

This sociological discussion of rationalisation in human behaviour continues to this day, with substantial critiques and contributions. Thus, any discussion about the mind and body of human beings should rightly include contemporary sociological theories on rationality as such as the ones developed by Habermas,⁴⁹ Heller,⁵⁰ Foucault,⁵¹ Giddens,⁵² or others.

The underlying discussion between these theories is between two opposite social scientific positions, which - again or still - create fundamental problems in the social research discussion. Because, according to Lars Bo Kaspersen: 'sociology distinguishes itself by performing a constant pendulum between the two types of sociological explanations. By this pendulum the figure [of sociology] is converted to a mutual interaction between structure and individuals. The structure is expressed as a social organisation with individuals who have internalised the values and norms. Conversely, individuals influence the values and standards of the social organisation by their actions, whereby the structure changes. In a more sophisticated version, the structure is the result of the unintended consequences from individuals' actions, which in turn become new unacknowledged conditions for future actions. There is, however, a fundamental problem in reconciling these two constructions, they cannot unite! Expressive and intentional causality contradict each other! A society can not simultaneously be composed of individuals in a social organisation that is caused by an underlying structure and also be the result of individuals' actions based on values.'⁵³

Kaspersen here argues that the mechanistic understanding of the human consciousness can not simultaneously be composed of individuals in a social organisation that is caused by an underlying structure and also be the result of individuals' actions based on values. Why not? Why is this not possible? Because Kaspersen is stuck in the occidental paradigm. I will try to explain this later in the chapter about quantum physics.

Newtonian-Mechanical Economy

All this new thinking that took place during the renaissance of course heavily influenced the thinking about economy. Before this transformation took place, the human production and creation of 'value' focused on 'usefulness' with the early mercantilists in the 16th and first half of the 17th century. The importance of this consideration became apparent in 1588, when Bernardo Davanzati failed to formulate a value theory based on 'utility'. The reason why the mercantilists had this particular focus was that they, as wholesalers, were dependent on the difference between the market purchase prices and selling prices, as opposed to producers who would rely on controlling the production process costs.

The scientific revolution and the criticism by Enlightenment, Reasoning, Empiricism and Individualism became the dominant values along with a secular and materialistic orientation that led to the success of producing worldly commodities and luxury goods. These new customs and activities resulted in the creation of new social and political institutions, also giving rise to a new academic purpose: to theorise a number of specific economic actions: production, exchange, distribution,

⁴⁸ Norbert Elias, 1976, pp. 51-81

⁴⁹ Jürgen Habermas, 1981

⁵⁰ Agnes Heller, 1999

⁵¹ Michel Foucault, 1977

⁵² Anthony Giddens, 1984

⁵³ Lars Bo Kaspersen, 1993, p. 117

money lending, etc. Economic dispositions became professions in themselves - without references to God, ethics or 'just' prices - and created the need for new description, understanding and explanation.

During the 16th and 17th centuries, the new values in terms of individualism, property and representative governments led to the dissolution of the traditional feudal system and the power of aristocracy. The old economic order was, however, still defended by economic theorists who believed that a national state's road to wealth consisted in the accumulating money from its foreign trade. This economic theory and school, later became known as 'mercantilism'. Its supporters did not call themselves 'economists', but rather perceived themselves as politicians, administrators and merchants. They transferred the old idea of economy - that economy consisted in managing a household - to the idea that running a state was like managing a somewhat bigger household. Therefore, their politics became known as 'political economy'. This term remained in use until the 20th century, when it was replaced by the term 'economics'.

“Things without use have no value.”

- NICOLAS BARBON

As an expression of this thinking, Richard Cantillon (168? -1734) suggested that value could be found by adding the value of a worker to twice the production of the land area he uses while allowing variations in the qualifications and status of the workers. When this was calculated, the internal values of any goods could be reduced to consist of the value of land. Another economist, Nicholas Barbon (1640-1698), believed that the value of goods was simply represented in their market price. For him, the value of all goods came from their use. Things without use have no value.

Ferdinando Galiani (1728-1787) used Davanzati and Montanari's early mercantilist theories on the subjective nature of the value. He developed a theory of utility and described the concept of decreasing marginal utility value. One of the most famous of his time, the economist, John Law (1671-1729), theorised the difference between the value of water and the value of diamonds, asking why relatively useless diamonds could be worth more than the indispensable water. He solved the problem by describing the value as a function of respectively supply and demand.

Towards the end of the seventeenth century, the understanding of the economists changed from the mercantilist's focus on 'utility value', to instead focusing on 'production costs'.

The transition to classic economy took place just over three hundred years ago. In the center of this transition was Sir William Petty (1623-1687), professor of anatomy in Oxford and a doctor in Oliver Cromwell's Army. In his circle of friends was Christopher Wren, the architect of many of London's landmarks, and Isaac Newton.

Petty's 'political arithmetic' seems to owe Newton and Descartes a great deal, as its method consists of replacing words and arguments with numbers, weights and goals, and only "using the arguments of reason and considering only those causes that are likely to occur in nature."

In his work, Petty gave up the subjective theory of 'value', and instead searched for objective laws in the 'natural world of realities' where 'natural value' was one of them. According to Petty, the market price of any product would continually fluctuate around its 'natural value'. He derived this from the fact that the natural value in production had to consist of land and work.

Petty presented ideas that later became indispensable in the theories of Adam Smith and other later economists. Among these ideas was the theory of work as the creator of value, which also Smith, Ricardo and Marx accepted. The idea was that the value of a product could only be derived from the amount and quality of human work required to produce it. Another theory consisted of the distinction between price and value, which in various formulations has since occupied the economists. Petty also analysed the concept of 'a just pay' and described in his work the benefits of division of labor. He also defined the term 'monopoly'. Furthermore, he discussed the Newtonian ideas about the amount of money and their 'speed' in circulation, debated by the monetarist school today. He

proposed public employment as a means against unemployment, thus preceding Keynes with more than two centuries.

Together with Petty, the liberal John Locke lay the foundation for today's economy. He was a prominent Enlightenment philosopher, and his ideas about psychological, social and economic phenomena - heavily influenced by Descartes and Newton - became the core of the 18th century thinking. Locke's atomic theory of human society led him to the idea of a representative government whose function was to protect individuals' property rights and the outcome of their work. Locke believed that once individuals had a government as an administrator of their rights, freedoms and property, their legitimacy was dependent on whether this government would be able to protect those rights. If the government failed to do so, the People should have the power to resolve it. A number of other economic and political thinkers were deeply influenced by Locke's radical moral concepts in Enlightenment.

In his economic thinking, one of Locke's most innovative theories had to do with the prices of goods. While Petty had determined that prices and goods should reflect the amount of work put into it, Locke suggested that prices were objectively determined by demand and supply. This not only released the merchants from the ethics and moral laws of 'just prices', it also became a cornerstone in economy, and got status similar to the laws of mechanics, as it stands today in most economic analyses.

The law on supply and demand fitted perfectly with the new mathematics developed by Newton and Leibniz - differential calculus - because economics was perceived as dealing with continuous variations consisting of very small amounts that could be described most effectively with this mathematical technique. This idea became the foundation for subsequent efforts to make economy an accurate mathematical science. However, the problem was - and still is - that the variables used in these mathematical models can not be quantified, and that they are defined based on assumptions that often make the models unrealistic.

A distinctive school from the eighteenth century, which had a significant influence on classical economic theory, and especially on Adam Smith, were the French physiocrats. These thinkers were the first to call their theories, 'theories of objective science' and to develop a complete image of the French economy as it existed just before the revolution. 'Physiocracy' means 'the rule of nature', and the physiocrats indifferently criticised mercantilism and the growth of cities. They claimed that only agriculture and the earth were truly productive of real wealth, and thus they can be perceived as early proponents for an ecological dimension in the economy. Their leader was, like William Petty and John Locke, a doctor, Francois Quesnay, who was the surgeon of



**Matter and emotions
help each other cool
off in the sun.**

the Royal Court. Quesnay explained the idea, that the laws of nature, if they were not prevented in this, would regulate economic affairs for the greatest benefit to all. Here we find the foundation of the idea of 'laissez faire,' which is the keystone of the economy today.

As it appears, the ethics and moral evolving in the 17th and 18th centuries gradually replaced the orderly and norm-constitutive middle-age cosmology, which was a belief in the sanctuary of the natural world; strict moral ban on money lending against interest rates; the requirement that prices should be 'just'; that personal gain and accumulation should be avoided; that work should be based on societal utility and the well-being of the soul; that trade was only justified as long as it met society's needs; and that all true rewards came in the next world.⁵⁴

As we see, economy used to be intertwined with ethics, moral and social considerations. In most of history, food, clothing, shelter and other basic resources have been produced for utility value and distributed within tribes and groups on a normative basis. In other words, a nation-state based market system is a relatively new phenomenon which emerged in the 17th century in England and spread from there to the rest of world, resulting in today's global market.

The Classic Economy

The classic economy was born in 1776, when Adam Smith published his book, 'An Inquiry into the Nature and Causes of the Wealth of Nations'. Adam Smith, a Scottish philosopher and a friend of David Hume, was one of the most influential economists of the time. His 'Wealth of Nations' was the first full-scale dissertation on economics, and is probably one of the most important book ever written when its results are taken into account. Smith was not only influenced by the French physiocrats and the enlightenment philosophers, but he was also a good friend of James Watt, the inventor of the steam engine. Smith met Benjamin Franklin and probably also Thomas Jefferson. He lived at a time when the industrial revolution began to change Britain's production, class division and policy.

Adam Smith was also part of Newton's social Circles, and was inspired by Newton in several of his economic considerations.

When Smith wrote 'Wealth of Nations'. England was in transition from an agrarian and craft-based economy to an economy dominated by steam-power and large factories and mills. 'Spinning Jenny' had been invented and machine weavers were being used in cotton factories that could handle up to three hundred workers. The new private companies, factories and steam-powered machines influenced Smith's ideas fundamentally, and he was an enthusiastic advocate for a social change of his time, criticising the remains of the land-based feudal system.

Adam Smith, like most of the great classical economists, was not an economical specialist, but was an insightful, imaginative thinker. He investigated how the wealth of nations could be increased and distributed - the basic theme of modern economy. To avoid the mercantilistic idea that wealth is created through foreign trade and by accumulating gold and silver, Smith stated that the true basis of wealth is production and a result of human labor and natural resources. A nation's wealth is dependent on the percentage of its people which is involved in production as well as their effectiveness and skills. Smith agreed with Petty that the fundamental means to increase production would be the division of labor.

From the dominating Newtonian way of thinking of natural laws, Smith deduced many things about human behavior - economic behaviour.

"The fundamental means to increase production would be the division of labor."

- ADAM SMITH

⁵⁴ Fritjof Capra, 1983, pp. 194

So, today's capitalist economy was created by a relatively small inner circle of British enlightenment philosophers, strongly inspired by Newton's new mechanical physics:

“The triumph of Newtonian mechanics in the eighteenth and nineteenth centuries established physics as the prototype of science against which all other sciences were measured. The closer scientists could come to emulating the methods of physics, and the more of its concepts they were able to use, the higher the standing of their discipline in the scientific community. In our century this tendency to model scientific concepts and theories after those of Newtonian physics has become a severe handicap in many fields, but more than anywhere else, perhaps, in the social sciences. (The social sciences deal with the social and cultural aspects of human behaviour. They include the disciplines of economics, political science, sociology, social anthropology, and - in the view of many of its practitioners - history.) These have been traditionally regarded as the 'softest' among the sciences, and social scientists have tried very hard to gain respectability by adopting the Cartesian paradigm and the methods of Newtonian physics. However, the Cartesian framework is often quite inappropriate for the phenomena they are describing, and consequently their models have become increasingly unrealistic. This is now especially apparent in economics.”⁵⁵

As we have seen, Newtonian physical science is itself a product of the Western thinking-tradition, the occidental paradigm. Newton developed many of the ideas that the early Greek philosophy and the Jewish-Christian monotheism created and build on. More specifically, Newtonian science reflects the cultural shift that shook European thinking during the Reformation, the thinking of Rationalism, Enlightenment and Cartesian thought about mind, body and rationality:

“On the historical side, substantial scholarship has been showing that from their origins in the seventeenth century to their consolidation in the late nineteenth the social sciences were deeply influenced by (classical) physics, the most successful and prestigious science of the day. For both intellectual and political reasons, our Founders — Hobbes, Hume, Smith, Comte, Jevons, Walras, Marshall, Pareto, and others - borrowed frequently from physics in their thinking about society. Bernard Cohen shows that this took various forms — analogies, metaphors, homologies, and identities — and argues that efforts to establish homologies and identities usually failed, leaving the overt impact of physics on the social sciences mostly on the analogical and metaphorical level. But even if classical physics was not fruitful for substantive theorising about social life, at a deeper level its impact was profound. By the early twentieth century the metaphysical assumptions of the classical worldview — materialism, determinism, locality, and so on — were deeply ingrained in the minds of social scientists. These assumptions were taken to be true of reality as a Whole, and thus fundamental constraints on social scientific inquiry.”⁵⁶

The French philosopher, Rene Descartes, in his philosophy separated body and mind by saying “I know that I have a mind and I know I have a body. And I know that the two are completely separate. I *am* my mind. I *have* a body.” Isaac Newton made this division the foundation of his new classical-mechanical physics, which excluded everything mentally or psychologically from the physical laws of the universe. The consequence of this is also an exclusion of ethics. The subsequent mechanical culture that this physique gave rise to is the culture that still dominates the mindset of most of us today and which uses the Newtonian machine categories in economics and organisations without any ethical foundation.

⁵⁵ Fritjof Capra, 1983, pp. 194

⁵⁶ Alexander Wendt, 2015, p. 12

Where Newton formulated the basic laws applicable to physical reality, the philosophers and sociologists in his wake hoped to discover and formulate the basic axioms and laws of cultural-social life. Newton's universal excavator became the model that was used to compare the state with a precise statutory mechanism and depict human beings as 'living machines'. Most without 'built-in' ethical-moral purpose and superstructure.

The basic building blocks in Newton's new physical world were defined as isolated and impenetrable dead atoms that were moving about in the empty space, colliding with each other like small billiard balls. The only actors in Newton's space-time drama were these particles, and there were only gravitation or repulsive forces working between them.

Political philosophers of the time compared these colliding atoms and their interacting forces with individuals' behaviour and interactions in society when these collided with each other in pursuing their own interests. In his book, 'Leviathan,' Thomas Hobbes described human actions as "the war of every human being against every human being."

Today, economists and sociologists who follow the 'Rational Choice' school argue that individuals always choose the rational action that satisfies their own interests. Finding a way to balance all these contradictory interests in society has been the basis of the conflicting democracy and thus forms the foundation of the confrontational style of modern political parties.

Thomas Hobbs, Adam Smith, John Stuart Mill and even John Locke used the new classical-mechanical physics as inspiration and examples in their thinking about state and society. Locke described himself as "a mere under-labourer to the incomparable Mr. Newton." Adam Smith was very impressed with the new Mechanical Science and built both his ideas about a free market economy and the division of labor on Newton's methods. Marx's deterministic historical views and Darwin's mechanical and reductionist theory of evolution are also both derived from the same source. Also the theorist, Carl von Clausewitz, used the Newtonian concepts in his book, 'On War,' where he uses concepts such as 'center of gravity', 'friction', etc. Today's 'realistic school' in International Relations theory resembles nations with billiard balls that collide into each other in a mechanical pattern of action and response, power-balances, and describe areas where there is no political-military power, as a political 'empty space'. Among the early pioneers of modern sociology, Vilfredo Pareto also took on the mechanical and thermal metaphors when he described the dynamics of society. And August Comte, who invented the word 'sociology,' initially called this new science a 'social physique.'



Is this symmetry a
rational choice?

Even the later, Sigmund Freud searched for 'laws and dynamics' that governed the psyche, and here he insisted that human behaviour was fully determined by such laws and that their interaction was a product of childhood experiences. Freud used Newton's atomism as the basis for his psychology. Freud's scientific model of 'the Self' is described by him as a complex hydraulic system (- just like the economist, Samuelson, who later described society's economy as a closed hydraulic system). In his theory about 'Object Relations' Freud stated that consequently each of us is isolated. He also perceived the limits of 'the Self' as hard and impenetrable. You are an 'object' to me and I am an 'object' to you. We can never really know each other in any basic way. I create a picture of you in my own mind, 'a projection,' and I can only relate to that. Thus, true love and intimacy are impossible, according to Freud. The religious command, to love your neighbour like yourself, Freud wrote, is the most impossible command ever written.

Conclusion, Part I

As we have seen, in the ancient Greece, the idea was conceived that atoms exist and that they are surrounded by emptiness. This idea led to the emergence of a certain sense of understanding of human consciousness, behaviour, consumption and economy. This also led to the idea that body and spirit are separate 'substances'. Outside 'substance' and 'emptiness' the only force holding this together was God.

Even if the universe and the things in it were divided into matter and emptiness, the universe and matter was considered to be alive and organic. However, the Newtonian-mechanical physics gradually led to the idea that nature consisted of 'dead' material and that everything was 'machines'. Through this development, the universe became a gigantic clockwork; plants were machines, animals were machines and human beings were machines. This division led to the division into two 'magistrates': in church (religion) and university (knowledge). This division meant that science had to find the 'mechanical' laws while religion had to relate to pure beliefs in relation to a Deity that was beyond the reach of science and which could not be described by the concepts and methods of science.

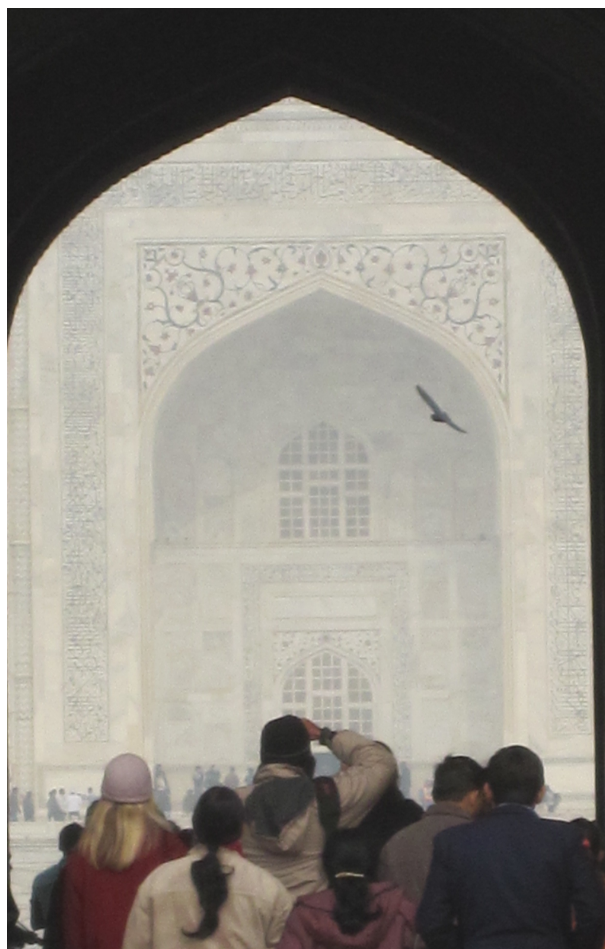
Because, Newton was the beacon of the time in terms of science, he was also for the thinkers of the economy. The classical economy's thinkers such as Adam Smith, therefore, sought to transfer the concepts and methods of mechanical physics to the classic economy. In this way, economy was initially conceptually closely linked to Newtonian-mechanical physics. Secondly, with the neoclassical economy, the perception of the economy's tasks and methods was strengthened by the development of highly abstract economical mathematics and models whose purpose was precisely to exclude external subjective factors which could consist of human ethical codes.

The claim was, and still is, that the economy simply has the task to develop an economic framework where the economic natural-like laws can objectively be uncovered, understood and function without the subjective interference from superstitions, subjectivity or power, just as the case was for earlier physics. The neoclassical economy thus made itself free from meaning, values, ethics, nature, people and society.

However, to conclude from physical concepts and research to human consciousness and behaviour is a fundamental scientific failure. A failure that still today characterises economic thinking.

The mechanical paradigm underlying both physics, biology, psychology, sociology and economics, therefor, resulted in fundamental explanatory problems in relation to consciousness, memory, learning and behaviour - including economic behaviour - which it could not and still cannot explain.

Against this background, the mechanical thinking and research is led into unsolvable hermeneutic causal paradoxes: such as the notions that 'I' am an isolated individual, who can independently and isolated think of something, come up with an idea, that I did this all by myself - and that I therefor can claim ownership of the idea or the product. This isolated 'I' leads to the ways of ownership, leadership and production we see today, and also leads to the problems humanity is confronted with towards nature. Nature is 'dead' matter and can be used endlessly, without any ethical reflections and



How would Newton explain the meaning of Taj Mahal?

considerations - they would be just limiting subjectivity.

And the Atoms turned into Energy...

The isolated individual, the competition, the conflicts and the fighting between persons, groups, companies and nation-states all goes back not to nature but ideas and concepts - and the central concept here is the unbreakable atom, the basic material constituting all things.

If this idea is so profoundly influencing human thinking, then only slight changes of this idea must clearly have vast impact on the occidental paradigm, language and the every day behaviour of the occidental individual. Therefore, we must ask: has the knowledge and idea about the atom changed since Newton? And the answer is 'Yes!'

It was about 1900, that serious questions were raised about Newton's mechanical physics. With the discovery of the X-rays, evidence was produced that showed that the atoms could have an internal structure and that they were not of an unbreakable nature. Other forms of radiation were discovered, and Ernest Rutherford discovered that these rays, alpha particles, were very fast 'projectiles' useful for exploring a sub-atomic level. The world into which Rutherford penetrated into was surprising and spectacular.

Instead of meeting hard solid and unbreakable particles, which had been the belief for more than 2000 years, since Parmenides, modern physics encountered 'large spacious areas', in which very small particles whirled around the atomic nucleus.⁵⁷

To get a better grip on the aspect ratio, you can imagine an orange on the size of the Earth. In this sumptuous orange the atoms would have the size of cherries. Lots of cherries compressed tightly together. In the cherries the 'core' would be so small that the naked eye could not see it. Here, we have to enlarge the cherry up to a size corresponding to St. Peter's Church in Rome. If the cherry was that large, the core would be the size of a spruce of salt. Around it, would dust would whirl in the huge space.⁵⁸

This planetary reality was a reality that was far removed from the former Euclidean and Newtonian 'massive' reality. In addition, nature 'replied' to the researchers when they sought to penetrate into this world, with paradoxes that were not understandable, or perhaps rather seemed unreasonable in relation to the perceptions of the scientists. The sharper the questions of the scientists, the sharper the paradoxes became. The scientists had to accept that these paradoxes arose because they attempted to describe sub-atomic events based

⁵⁷ Stanislav Grof, 1983

⁵⁸ Fritjof Capra, 1975: 68

on traditional three-dimensional physical concepts.

Rutherford's experiments showed that, rather than being small hard particles of un-degradable matter, the atoms consisted of huge space, in which really really small particles whirled about. The formulation of quantum theory made it clear that even these small particles had nothing in common with the classic physics's notion of solid objects.⁵⁹

The sub-atomic particles are very 'thought-up' objects, which are of a dual, almost paradoxical character. Depending on how they are observed, they sometimes appear as particles and sometimes as waves. They can thus be a particle with a very small volume, and at the same time be a wave that covers a very large area of space - all depending on the method of measurement.

This paradox questioned the very foundation of the mechanical paradigm - the notion of the reality of the substance - it might not exist at all? ⁶⁰

Contrary to the mechanical image of reality, which claimed that objective matter existed, recent physics, based on high-energy research and theories, claims that substance does not exist in certain places, but rather that it tends to exist and that even this is not certain at certain times and ways.⁶¹

When talking about particles and waveforms, it must not be understood as real three-dimensional waves of sound or water waves, but as probability waves in abstract mathematical form - the human perception of this 'reality' is our own ideas and perception.⁶²

**“The whole
always includes
the awareness
of the observer.”**

- FRITJOF CAPRA

According to quantum theory, the universe is not built from fundamental isolated building blocks, but rather consists of a complex network of connections in one whole. This whole always includes the awareness of the observer or scientist, which constitutes the last link in the chain of observation, and the sub-atomic particles can only be understood as the interaction that occurs between experiment and measurement.

With these 'observations' by quantum physics, this has the consequence that the cleavage, that Descartes claimed to exist between soul and matter, falls apart.

The quantum physics has shown that the human being cannot talk about nature without talking about itself, and about

what consciousness and thoughts really are. In this way, research by quantum physics is merging with other research fields such as, for example. brain research, depth psychology - and ultimately with most rationality theories. When the atom consists of sub-atomic particles, which in turn express probabilities of energy patterns, then this is rather an expression of the human sensory perception of reality than of reality itself.

But why does the human being experience matter as hard, when it almost only consists of energy and empty space?

This is due to some very special characteristic of the sub atomic particles. When the sub-atomic particles are shut in, inside a very small space, they react by getting 'claustrophobia': they dodge - and the smaller the space, the higher the speed.⁶³

In this small space, there are two opposing forces: one is the the electrical force that seeks to keep the particles as close as possible; and the other is the response to this incarceration, which is the

⁵⁹ Fritjof Capra, 1975: 69

⁶⁰ Fritjof Capra, 1975: 70

⁶¹ Fritjof Capra, 1975, p. 70

⁶² Fritjof Capra, 1975, p. 71

⁶³ Fritjof Capra, 1975, 1983; Stanislaw Grof, 1983

whirling around. The closer the particles are bound to the nucleus, the higher the velocity, the faster the swirl. Thus, the electron incarcerated in the atom can result in speeds of approx. 950 km/sec., which is why, for the three-dimensional macroscopic world in its Euclidean linear-causal-space, which the space or perceptual level of the human sensory apparatus, it looks like a solid ball. The alternation between electrons and atoms is the foundation of this world of incredible wealth of different phenomena.⁶⁴

The atomic nucleus of this system is approx. 100,000 times smaller than the entire atom's mass. The substance of the nucleus must therefore be incredibly compact if we compare this with the types of substance we - human beings - have become accustomed to. The atomic nuclei or the nucleons, which consist of protons and neutrons, have the same quantum character as the electrons, which is why extremely high velocities occur in the atomic nuclei.⁶⁵

So, when protons and neutrons are squeezed together in a place that is approx. 100,000 times smaller, then the speed is also correspondingly higher. The particles in here move at speeds of up to 64,000 km/ sec. The explanation for this phenomenon is the strong nuclear power that works so that when the nuclei come close to each other, which is about two to three times their diameter, then the nuclear power is high attraction, but when it becomes smaller, it becomes highly repulsive. Thus, the particles are retained in a nucleus form of an extremely stable but at the same time extremely dynamic equilibrium.⁶⁶ Between these very dynamic nuclei particles, the electrons swirl. They only correspond to a fraction of the total mass, yet, from the human's point of view, give the substance its solid character, which enables it to build larger molecular structures. Due to the high velocities of the particles, it has been necessary to add the theory of 'relativity' to quantum theory. The particles that move in the space of the nucleus come close to the speed of light. A theory that totally includes quantum and relativity theories has not yet been formulated.⁶⁷



**Nature enjoying art?
Or are the doves
actually discussing
what they have seen?**

The Massless Universe

The development of quantum and relativity theory has profoundly changed the concept of matter, as it showed that mass had nothing to do with an

⁶⁴ Fritjof Capra, 1975, p. 72

⁶⁵ Fritjof Capra, 1975

⁶⁶ Fritjof Capra, 1975, p. 76

⁶⁷ Fritjof Capra 1975, 1982; Stanislav Grof, 1983; Werner Heisenberg, 1969

unbreakable mass, but that substance or matter rather consisted of energy, which came from a dynamic whole of energy processes in which the particles are formed and degraded in rhythmic pulses - something that could resemble what the Hindus call Shiva's dance of creation and destruction, birth and death, the foundation of all existence. According to the theory of relativity, space is not three-dimensional and time is not linear; none of them are isolated entities. They are intimately interwoven, and constitute a many-dimensional continuum called 'space-time'. The stream of time is not linear and uniform as in the Newtonian model; it depends on the position of the observers and their relative velocities relative to the observed event. Furthermore, the theory of relativity claims that space-time is influenced by the presence of 'massive' objects. The variations in the gravity field in different parts of the room therefore have a curving effect on the room, and make time to go at different speeds. However, this has not yet been experimentally proven.⁶⁸

The mass of a particle corresponds to a given amount of energy, and is thus not a static thing, or an object, but part of a process that manifests itself to the human being's perception and consciousness as solid mass.

Before quantum physics was discovered, the fundamental question was whether the researchers in the research process in degradation of 'matter' would reach a smallest and fundamental 'unit' - the atom. The answer has been given, but not with a 'yes' or a 'no' - because the answer came from a completely different logic.

It is the observer, the consciousness, that breaks the universe's unbroken whole and thus creates the paradoxes. The instantaneous experience of reality does not seem paradoxical at all. It is only when the observer tries to think and to construct her/his perception and experience history that the paradoxes emerge.⁶⁹

Substance (!?) responded by consisting of observations and energy and not of substance... (?)

Hmmm... Well, as we see, quantum mechanical physics, turned Newton's most basic concepts on their heads. How would, from this point on, basic concepts such as substance, causality and consciousness be perceived? And what would a quantum mechanical world view entail in relation to the social science theories and to economical theory, one wonder?

The Copenhagen interpretation emphasised the principle of local causality, which occurred at the expense of the objective existence of the micro-world. According to the Copenhagen interpretation, there is no reality before this reality is experienced. From other branches of science, the most far-reaching interpretations of this are those assuming that psyche plays a crucial role in the quantum reality. In fact, there are researchers who suggest that the mind or consciousness affects or even creates matter.⁷⁰

Albert Einstein, who started the quantum physical development, was not willing to accept all of this until the end of his life, something he expressed in this sentence: "God does not play dice"; here, Einstein refers to Newton's original considerations, in his experimental set-ups with falling bodies. Newton's consideration was precisely whether God would interfere or not? Einstein, after numerous discussions and arguments with the leading representatives of the Copenhagen School, remained convinced that a deterministic explanation in the form of 'hidden local variables' would be discovered in the future. Einstein was determined to show that the Copenhagen interpretation of quantum theory was wrong, and thus constructed an experiment, which has only recently become possible to

⁶⁸ Fritjof Capra, 1975; Ken Wilber, 1985

⁶⁹ Stanislav Grof, 1985, p. 416

⁷⁰ Stanislav Grof, 1985, p. 417

implement. This experiment has become known as the Einstein-Podolsky-Rosen (EPR) experiment.⁷¹ The EPR experiment forms the basis of John Bell's theorem, which, however, proved that Descart's notion of reality is incompatible with quantum theory:

"A simplified version of the EPR-experiment involves two electrons that have opposite spin, so their total spin is zero. You then separate them until the distance between them becomes macroscopic; their respective spin can then be measured by two independent observers. The quantum theory predicts that a spin on one axis in a system of two particles with a total spin of zero will always be associated with a reverse spin of the other axis. Although one can only speak of tendencies to spin, before the real measurement, the potential spin turns into something specific once this measurement is made. The observer is free to choose which axis he wants to target, and this instantly determines the spin of the second particle, which may be thousands of kilometers away."⁷²

According to Einstein's theory of relativity, no signal can move faster than the light, and according to this theory, the EPR experiment should be impossible. Thus, the instantaneous non-local connection between the particles in the EPR experiment cannot be mediated by a signal in the Einsteinian sense, and thus exceeds the conventional theories of information transfer. Bell's theorem poses a dilemma for physicists, as the experiment suggests that the world is either not objectively existing, or that it is connected by information transmissions that can move at speeds higher than that of light. Thus, according to Henry Strapp, Bell's theorem points to the fact that the deep truth about the universe is that it is either fundamentally lawless or fundamentally inseparable.⁷³

"Although quantum-relativistic physics delivers the most compelling and radical criticism of the mechanical worldview, important revisions have been inspired by different research in other disciplines. Drastic changes of a similar nature have been introduced in scientific thinking through the development of cybernetics, information theory, system theory and the theory of logical types. One of the most important representatives of this crucial direction in recent science is Gregory Bateson. According to Bateson, thinking tied to the notion of substance and separated objects is a serious epistemological mistake - a mistake in logical type. In everyday life we never deal with objects, but with the transformations they give rise to in the human senses, or with messages of differences - in the sense of Korzybski, we have access to the maps, not to the landscapes. The information runs in circles that transcend the individual's conventional boundaries and encompass the surroundings. This scientific way of thinking makes it absurd to treat the world as if it were separate objects and entities, to consider the individual, the family or the species as the Darwinian survival unit, to distinguish between mind and body or to identify with the ego body (Alan Watt's 'Skin encapsulated ego'). Like the quantum relativistic physics, the weight has shifted from substance and object (flux) to form, pattern and process."⁷⁴

According to Stanislav Grof, a new definition of the mind and mental function has been formulated by the systems theory, as it has demonstrated "that any sum of parts and components having an appropriate complexity of closed causal cycles and appropriate energy conditions will exhibit mental characteristics - and respond to differences, process information and be self-correcting. In this sense, it is possible to talk about mental characteristics of the body's various cells, tissues and organs, by a

⁷¹ David Bohm, 1986; Stanislav Grof, 1983

⁷² Stanislav Grof, 1983, p. 417

⁷³ David Bohm, 1986; Stanislav Grof, 1983

⁷⁴ Stanislav Grof, 1983, p. 418

cultural group or nation, by an ecological system or even by the whole planet, which Lovelock has done in his galaxy theory. And when we consider a larger mind that integrates all the lower hierarchies, even a critical and skeptical scientist like Gregory Bateson must admit that this fantasy comes close to the notion of an immanent God.”⁷⁵

In relation to the biological consequences of quantum physics, Grof refers to the British biologist and biochemist Rupert Sheldrake, who with his book ‘A New Science of Life’ comes up with a fundamental criticism of the limitations and inability to confront fundamental problems which the mechanistic science has within the areas of morphogenesis during the individual’s development and the evolution, genetic or instinctive and more complex forms of behaviour of species:

“The mechanistic science deals only with the quantitative aspect of the phenomena, which Sheldrake calls ‘energetic causation’. Mechanical science has nothing to say about the qualitative aspect - the development of forms or the ‘formative causation’. According to Sheldrake, living organisms are not just complex biological machines, and life cannot be reduced to chemical reactions. The shape, development and behaviour of organisms are shaped by ‘morphogenetic fields’ of a type that physicists have not at present recognised. These fields are formed by the shape and behaviour of previous organisms of the same species through direct connections over both space and time. These fields have cumulative properties, if a certain number of members of an animal species develop certain organismic properties or learn a particular form of behaviour, this is automatically acquired by other members of the species, although no conventional form of contact exists between them. The phenomenon of ‘morphic resonance’, which Sheldrake calls it, is not limited to living organisms and can be demonstrated by such elemental phenomena as the growth of crystals.”⁷⁶

Although this theory may seem unlikely, it is possible to test it in contrast to the fundamental metaphysical assumptions of the materialist worldview.

As scientists have penetrated into the deepest structures of matter and have studied the diverse aspects of the processes of the world, the notion of solid substance has gradually disappeared from their ideas, concepts and methodologies; and what they were left with were archetypal patterns, abstract mathematical formulas, or universal order that looks more like a system of thought processes than a gigantic clockwork.

It therefore seems neither mysterious nor unfounded to consider the possibility that the connecting principle of the cosmic network of energies is the consciousness as a primary and no further reducible feature of existence.⁷⁷

Sensing, Remembering, Experiencing and Learning

We have already looked at the impossibilities that philosophy and theory have had to face when they tried to place and explain human consciousness in isolated mechanical physical matter, the brain and its sensing organs.

To recapture: the ancient philosopher Epicurus “believed that there existed ‘soul-atoms’ which were distributed throughout the body that could explain both consciousness and the general vitality of the human being - but many of the ancient Greek philosophers rather believed that the heart or chest was the source of these. Others have assumed that consciousness arose from liver function or the blood. According to Hindu philosophers, consciousness is concentrated in the line of ‘chakras’ down the back - hence our presumed ability to master it by yoga - while Descartes in recent times, as

⁷⁵ Stanislav Grof, 1985, p. 419

⁷⁶ Stanislav Grof, 1985, p. 421

⁷⁷ Stanislav Grof, 1985, p. 422f

we have already seen, has suggested that the point of contact between soul and body could be the mysterious pineal gland in the middle of the brain.”

⁷⁸ But even Descartes had to give up his explanation, and in fact ended up explaining consciousness as being produced by an external God, who, from his place beyond both matter and consciousness had created both.⁷⁹

In particular, this construction becomes interesting when we consider the development history of rationality which we have just gone through. Because over time, philosophers and scientists have abolished the God that Descartes and later Kant placed as a guarantor of the mechanical universe and the human consciousness. If not in God, then where and how could the human consciousness come from, how could it be creative and come up with new ideas - and how could it be consistent over time? This is where modern brain research becomes important and exciting.

In the 1960s Karl Lashley had researched the brain's capacity to memory for thirty years. He had tried to find the ‘man in the machine’, the ‘engramme’ or the organ/substance in the human brain, where the memory lay. His method consisted of training animals, and then selectively damaging parts of their brain. He thought that at some point he had to find just the place where the memory was located. He was able to degrade the animals’ ability to perform the

“Where is ‘the man in the machine’?”

- KARL LASHLEY

learned, but to erase the memory of something once learned was not possible for him, unless he killed the animal. At one point, Lashley was so confused that he frustrated said that his research had only shown that learning was simply an impossibility. And yet, it is an everyday experience that it can be done. His question had to be wrong, somewhere.⁸⁰

One of his students, Karl Pribram, was being curious and asked himself how it might be possible that memory could be in the brain and still not be stored in a particular place?

Pribram did not come closer to an answer before he in Scientific American read an article about holograms. A hologram is a lensless form of photography that produces a three-dimensional image. It can be viewed from different angles, and looks like it floats freely in the room. One of the most



**Illusions - made by
humans - humans
made by illusions.**

⁷⁸ Danah Zohar, 1990, p. 56f

⁷⁹ David Bohm, 1986, p. 176

⁸⁰ Ken Wilber, 1985

interesting phenomena of the hologram is that a piece of it contains it all, and the whole is contained the piece, so if one piece was broken off, one could still see the whole picture in it.⁸¹

Perhaps this kind of 'memory' or 'imaging' could explain Pribram's question to how the brain produced memory? Perhaps the brain worked as an 'interpreter' of frequencies that formed 'images' that, like the hologram, and so could not be broken down into its smallest parts? Through many years, Pribram and other researchers developed a whole new understanding of how the brain functioned. They thought the brain, in order to sense - see, hear, smell, taste - performed complicated calculations of the 'information frequencies' it captured. A network of nerve impulses running along and between the cells through a network of fine fibers. These fibers would move in slow waves as the impulse crossed the cell; Maybe these waves were performing this calculation process - thus producing a consciousness mind and its memory?⁸²

This, however returned Pribram to the classic question of the foundation and formation of the consciousness: Because, if now the brain only collects images and knowledge in the form of a hologram, then, who or what is it that interprets the hologram? Who is the little man in the brain-machine... and who is the even smaller man in the little man's brain-machine, etc. etc...

At a certain point in the research process Pribram reached the conclusion that the whole universe had to be a hologram. By this conclusion, he had come close to the Greek idea about a 'pneuma' and the 'truths' that eastern religions had described.⁸³

The Quantum Self - A New Impetus?

At this point, the physicist and philosopher, Danah Zohar,⁸⁴ offers yet another explanation of memory - her analysis takes the departure in the memory of a 'quantum brain'. She starts by returning to the classic question of the physical-biological 'place' of consciousness. She then, again, seeks the physical place where the senses gather the informations from the universe into a whole.

Just as Kant did, Zohar focuses on 'what' consciousness is. Consciousness can not be identical to the capacity of the higher brain functions of the human being, which are a function of the neuronal connections in the cerebral cortex. She admits that the form of human consciousness takes, ie. the content of its senses and thoughts are influenced by these connections, but then the very ability of consciousness - the completely unstructured, raw consciousness - this must, she argues, be of a much more fundamental character.⁸⁵ Zohar thinks so, because "some animals are conscious, but have no cerebral cortex, while others only have a very primitive cerebral cortex. Some people who get large areas of their cerebral cortex destroyed or aborted may lose a certain function, e.g. speech or sight or mobility, but they are still conscious. Consciousness in itself, which encompasses the general ability to show attention and appropriate responses, must emanate from a physical mechanism that is far more primitive than the highly developed human brain - from a mechanism available to even the lower-ranking amoeba. The understanding how this can happen - that is, the identification of a basis for consciousness that

**“Where does all
the sensations
'unite' to
become 'me'?”**

- DANAH ZOHAR

⁸¹ Ken Wilber, 1985

⁸² Ken Wilber, 1985

⁸³ Ken Wilber, 1985

⁸⁴ Danah Zohar, 1990

⁸⁵ Danah Zohar, 1990, p. 60

explains the consciousness of all living (and possibly also non-living) creatures - is absolutely crucial to the understanding of where and when human consciousness arise. ⁸⁶

The Problem of the Unity of the Human Mind

This again leads us to the closely related problem: where does all the sensations 'unite' to become 'me'?

So, the central problem for understanding consciousness in physical terms is still the question that John Locke formulated, that Hume dissolved and which Kant attempted to mediate, namely the question of how the characteristic 'unity' of consciousness, sensing, thinking, feeling and memory was created. And as we saw, Lashley could not hit the place in the brain, where memory were situated. But, where did alle the sensations become united so that all my sensations was all the could become 'me'?

The unity of human experience that holds the thousands of sensory impressions together is the basis of all other attributes of this experience. The many separate features of apples or general visual impressions, in human consciousness, are interrelated and constitute a whole - but how? ⁸⁷ If this unity was absent, there would not exist any experience and no thinking could arise; the world which the human being presupposes would not exist - there would be no apples, no gardens, no 'I' experience (personal identity or subjectivity). Thus, according to Zohar, the unity of consciousness must be the most crucial feature of consciousness.

However, this unity, which is the prerequisite for consciousness, is deeply mysterious. There is no immediate comparable entity in any system in nature. All of the classic Newtonian physics and the mechanical technology based upon which this thinking is built, is about the isolation and separation of things, physical or biological components, and how they affect each other in this separate reality. But, as we have seen, no process of classical physics can explain the unity of human consciousness. ⁸⁸

However, with the development of quantum physics, new possibilities are given for an understanding of this centuries-old problem:

"Quantum physics involves many highly intriguing and mysterious kinds of behaviour. Not the least of these are the (non-local) quantum correlations which can occur over widely separated distances. It seems to me to be a definite possibility that such things could be playing a role in conscious thought modes. Perhaps it is not too fanciful to suggest that quantum correlations could be playing an operative role over large regions of the brain. Might there be any relation between a 'state of awareness' and a highly coherent quantum state in the brain? Is the 'oneness' or 'globality' that seems to be a feature of consciousness connected with this? It is somewhat tempting to believe so." ⁸⁹

Quantum systems are actually reminiscent of the way in which separate neurons co-operate throughout the brain to produce a focused state of focussed consciousness:

"... nerve cells in the human brain are sufficiently sensitive to register the absorption of a single photon (mirroring the passage of an individual electron from one energy state within the atom to another) - and thus sensitive enough to be influenced by the whole panoply of odd quantum-

⁸⁶ Danah Zohar, 1990, p. 60

⁸⁷ Danah Zohar, 1990, p. 62

⁸⁸ Danah Zohar, 1990, p. 60

⁸⁹ Roger Penrose in Danah Zohar, 1990, p. 61



Different forms of steady states?

level behaviour, including indeterminism and non-local effects.”⁹⁰

This linking of consciousness, thinking and sensation to quantum physics is actually quite necessary if we want to understand human memory, learning processes, development, an inspirational conversation, or a good idea, because with the understanding of the brain by the deterministic laws of classical physics, it cannot actually transcend itself and give free play to thought processes; there is no basis for a free will or a conscious intention. “No physical brain mechanism obeying the determinist laws of classical physics could account for freedom of thought or will, nor for any of the free actions that might follow from them.”⁹¹

According to Zohar, the physicist, Yuri Orlov is claiming somewhat the same: “that in any kind of doubt, resolution or creative thinking, quantum indeterminism and superimposed probability states (virtual states) must be playing a role in the brain’s openness to all the potentialities latent in consciousness - for example, our ability to see many possibilities all at once, intuitive:

”The described mechanism [quantum indeterminism] ... gives a key to the understanding of creative thinking, when a person states or depicts ‘what in fact does not exist’. According to our approach, the person potentially ‘sees’ several versions simultaneously without completely realising any of them, and then one version ‘pops up’ (materialises) as the result of a free choice.”⁹²

Only one of a given number of quantum possibilities can exist in ‘the real world’, but before that one actually decides to materialise, the quantum world allows the human being in an inspired, imaginative and potential moment to have ‘look’ around at the other possible decisions - we call this ‘intuition’.

Is Locke's Black Board a Quantum Phenomenon?

If the physical basis of consciousness is a quantum mechanical phenomenon, with the freedom it entails, then there is still a great deal that remains to be explained. What kind of quantum process do they talk about? And how does the brain’s structure support such quantum processes?

If we stay a little while with the classical problem of the unity of consciousness, which Locke, Berkeley, Hume and Kant fought over in their

⁹⁰ Danah Zohar, 1990, p. 61

⁹¹ Danah Zohar, 1990, p. 62

⁹² Danah Zohar, 1990, p. 62

explanations of consciousness and cognition, and take a look at the background state of all consciousness - the 'black board' on which various individual thoughts and sensations are 'written' - then we look at what physicists would term a dynamic state of equilibrium. This state is spatially completely uniform and unchanged over time, a characteristic which would be necessary for consciousness in order to have memory, and over time to perform a meaningful human action, to work or to act economically.

Without this 'steady state', the human being would not be able to remember, learn, speak or work, or to interact meaningfully in a social order, something Kant pointed out in his discussion with Hume.

The human consciousness thus has a quantum mechanical character of being an 'unbroken whole'. Consciousness is inter-connected and so are our experiences. This kind of uniformity is very rare among nature's dynamic processes, but it occurs for example in materials that are in a so-called 'condensed phase' - which is a liquid and crystalline form. The condensed phase refers to the degree of order involved. Thus, e.g. water has three phases: gaseous (water vapour, mist), liquid (water) and solid (ice), and the 'orderliness' of the water molecules is increasing from the first to the last. There are other well-known examples of condensed phases in the physical nature: ordinary magnets, superfluids, superconductors, laser light, metal electric currents and sound waves in crystals. The common characteristic of these is a certain degree of unity, coherence or phase-consistency, which causes the many atoms or molecules of which the material consists to behave as one.⁹³

Zohar refers to several researchers who have "...suggested that consciousness might depend on the brain somehow taking on the characteristics of a superfluid or a superconductor." (...) And, in fact, there is one. The 'pumped system' first described by Professor Herbert Fröhlich of Liverpool University in England some twenty years ago, and known to exist in biological tissue, seems to satisfy all the necessary criteria. Fröhlich's 'pumped system' is simply a system of vibrating electrically charged molecules ('dipoles' - positive at one end and negative at the other) into which energy is pumped. The vibrating dipoles (molecules in the cell walls of living tissue) emit electromagnetic 'vibrations' (Photons - to be exact: 'Virtual' photons with a limited range of interaction.), just like so many miniature radio transmitters, as they jiggle. Fröhlich demonstrated that beyond a certain threshold, any additional energy pumped into the system causes the molecules of that kind to vibrate in unison. They do so increasingly until they pull themselves into the most ordered form of condensed phase possible — a 'Bose-Einstein condensate'.⁹⁴

What distinguishes Bose-Einstein condensates from other condensates is that the many parts included in such a condensate not only *behave* as a whole, but actually *become* whole. Their identities merge, or even overlap in such a way that they completely lose their individuality.⁹⁵

This explains how the human mind has the capability to be aware of several things at the same time - that you, for example, can hold a conversation going while driving, watching a movie, thinking about tomorrow's task at the same time and then constantly experiencing yourself as 'one field of attention'. "There is not one someone sitting here being conscious of an ash tree on the bank of a canal, another someone noticing the rattle of a nearby train, and yet a third someone being aware of mild backache. They are all one person, 'me'."⁹⁶

⁹³ Danah Zohar, 1990

⁹⁴ Danah Zohar, 1990, p. 65

⁹⁵ Danah Zohar, 1990, p. 66

⁹⁶ Danah Zohar, 1990, p. 77

For a person who holds all these different, but common 'mini-conscious' experiences, to be one integrated 'I', there must be 'something' that explains the unity between the different brain states that stably maintain the connection over time with each of these experience elements. In order to assemble these into a unit, the separate brain states that perceive and treat each element must be identical. "All their properties and all their information must overlap completely. This form of unity exists only in Bose-Einstein condensates."⁹⁷

Conclusion, Part II

The human body obeys the mechanistic laws that Newton described and transformed into science. The body will fall towards the Earth according to the laws of gravity, and the three-dimensional body can only be one place at a time.

The human consciousness and mind, on the contrary, will not fall according to any laws of gravity, and the mind seems to have the capacity to be multi-dimensionally present in more places and times at the same time.

This means, that there is a fundamental difference between the two. But, somehow they are in this life merged and dependent on each other. If this merging is explained materialistically to take place in the pineal gland, or 'spiritually' in quantum physics and 'pumping systems' - none of these explanations can explain the happiness of a child when they receive an ice-cream or celebrate birthday with their friends.

So, neither mechanical physics nor quantum mechanics can explain for example fashion or the beauty of a painting.

They, however, must be able to explain fundamental aspects of human life, such as consciousness, experience, memory and learning. And here it seems that the mechanical-Newtonian physics is very well used when it comes to airplanes, boats or cars, but not very suitable when it comes to consciousness, experience, memory and learning; this is where quantum mechanics is much better suited.

So, when it comes to consciousness, experience, memory, learning, language and culture quantum theory opens for the possibility, that this can be explained - but not understood. The process of understanding, is still a cultural process about different attributions and interpretations of meaning, and it is this meaning that opens for an ethical dimension of the social processes of production and consumption.

Where the newtonian-mechanical physics perceives the physical world as a primary foundation for consciousness, quantum physics perceives - through a lot of repeatable physical experiments - that consciousness or 'spirit' is the



Water running up - not down as you think.

⁹⁷ Danah Zohar, 1990, p. 66

foundation of the physical world. It is the perception of the human consciousness, mind and senses that 'creates' the world through 'breaking' the 'wholeness of everything' - it is from here that all the isolated things that come with all its paradoxes arise.

So where mechanical physics perceives the human being as a randomly created machine without any possible ethical dimensions attached to its life and behaviour, quantum theory describes consciousness as the primary foundation of matter; and describes that this consciousness is constantly created out of a randomly composed network of energies, which occurs from a 'creative vacuum.'

This 'image' transforms the whole universe back to being an organic and live universe, in which all creations are dependent on and created out of the same creative process. All human beings come from the 'vacuum', we are all part of the same 'mind' and 'spirit.' Does this, then, take humanity back to former forms of spirituality? I don't think so. I think that what Capra here writes about physics also applies to ethics, sociology, economics, and so on:

"If physics today gives us a world view that is essentially mysterious, it is in a sense a return to the source of science 2500 years ago. It is interesting to follow the winding line of Western development of science, which began with the mysterious philosophies of the early Greeks, and then raised and unfolded in an impressive intellectual growth, which increasingly moved away from its mysterious origin and created a worldview in sharp contrast to the one found in the Far East. In its recent stages, Western science has once again left its world view, and has returned to the first Greek and Oriental philosophies. This time, however, its attitudes are not solely based on intuition, but also on extremely accurate and thoughtful experiments combined with a strictly logical formalism." ⁹⁸

Just as the research processes into physics developed advanced mathematics and usable knowledge and models for production; just so will the world-view of quantum physics develop new scientifically mature and proven concepts of consciousness, which will influence ethics, moral and in turn the human sciences - and in the end behaviour, production and consumption.

"The scientific thinking of today's medical sciences, psychiatry, psychology and anthropology is a direct extension of the 17th century Newtonian-Descartian model of the universe. As all of this model's basic assumptions have been transcended by the physics of the twentieth century, it seems only natural, sooner or later, to expect profound changes within all the scientific branches directly derived from it." ⁹⁹

What, then, does this development mean for the social sciences and economics? It means that the idea of completely isolated things, the idea of gravitation, the idea of friction, the idea of conflict, the idea of survival of the fittest (which actually did not fit into this mechanical idea in the first place), the idea of egoistic/evil human beings, the overarching idea of everything being machines - all these ideas have to be re-written on the basis of a whole new paradigm.

Human beings are not isolated living creatures in an empty and dead universe; conflicts and competition are not given factors; values and ethics are not 'subjective' externalities, but to the contrary values and ethics are the foundation of the human consciousness, mind and (moral) action.

This will all impact on both a future society and its economy. We will see an economy in which isolated 'ownership' and isolated 'profit' change to express the values, ethics, understanding and moral actions of the human being. This will also change the participatory procedures and processes in organisations and with it 'leadership' and 'expertise'.

⁹⁸ Fritjof Capra, 1975, p. 19

⁹⁹ Fritjof Capra, 1975

To be more exact, the idea that being conscious and thinking is isolated processes taking place in isolated human beings will change to - probably - be understood as at some point collective conscious creative processes to which no single person can rightfully claim 'ownership'. Human beings on more levels help each other being conscious, help each other think, help each other to have a practical language - how would it then be possible to claim: it is my idea; I invented it; I own it - it is only mine!

The production of knowledge and experience through research, and the building of physical and social structures are, however, all dependent on effort of the single person or group, and the process takes time. In order to finance this, practical economical solutions must be invented, and so new ethics and moral will surface eventually - as they have before in human history.

We can also already today begin to build companies that experiment with new understandings of ethics, new ownership, new leadership, new ways of sharing and new ways of producing. This is what TurningPoints has decided to do: to experiment, experience and from here to develop new peaceful companies based on a new ethics that comes with a new world view. Nothing less...

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