

Hans Widmer

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# The Concept of Uncompromising Humanism

Knowledge as the foundation  
for an enabling and enabled society

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An essential aspect of the constitution of all living structures is the urge to exploit the possibilities of existence to the full. New kinds of organisms need to be ever more adaptable in order to live among the existing ones. The ultimate development of biological evolution is the phenomenon of “consciousness”, which has spectacularly expanded the existential possibilities of the human species. This is clearly demonstrated by human beings’ domination of the world compared with the mere survival of their ancestors. By virtue of its superiority, this consciousness collectively creates a world that is *above* nature, for which the instincts, which successfully guide other primates through their niches *in* nature, are never sufficient. Only the conscious can guide people through a world created by conscious beings. The crux of this is that the instincts are the same, and the conscious is at their service—but with the evolution of culture it is increasingly in conflict with them.

# **The Concept of Uncompromising Humanism**

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for an enabling and enabled society

Hans Widmer

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and Dieter Rister

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# **What is to be gained from the Concept of Uncompromising Humanism?**

## **The key findings**

The Concept of Uncompromising Humanism derives its findings step by step: starting with the way in which humans observe the world, through elementary particles to state philosophy. In order to manage the vast quantity of facts and conclusions in a reasonable space the Concept is expressed with a high degree of abstraction. Below is an overview of the key findings:

1. The world is knowable—without mystery of any kind. The process of knowing is also knowable (the Concept of Uncompromising Humanism is also a complete theory of knowledge).
2. The quintessential knowledge is this: human drives and intuitions
  - are not distinct from the drives and instincts of other higher primates;
  - are not, however, sufficient for successful navigation through a world designed by humans.
3. It is only reason that can show the innocent innermost being of a person the way through this world. Reason is at our service. The same reason, in the capacity of an accord between the members of a society, enables a framework to be formed within which all life can be led to fulfilment.
4. The basis for the success of reason is knowledge: of the world, of that which makes us human; for individuals, in particular the

knowledge of that which drives and guides them. Knowledge is a hypothesis confirmed by reality; there is no knowledge that has not been provided by reality. The total knowledge of humanity comprises that which has been built up to date; there is no knowledge that is known by no one.

5. Thinking (equivalent to consciousness) is an evolutionary leap forward: what had until that point been mere biological data processing becomes independent, liberates itself from instinctive drive and guidance and builds up its own data basis. This includes a Self that instigates and coordinates thought.
6. Drives and intuitions communicate themselves to thought as feelings. A feeling is the command to solve a problem, to find out what is behind a sensation of unease, to preserve a status or to grasp an opportunity. Feelings have no meaning without thought and vice versa.
7. Free Will is the openness to the resolution of a command—not the freedom to choose the command, or who you are at the moment of choice.
8. Happiness is the reward for life-affirming behaviour—in all time horizons from the slightest activity to the shaping of one's whole life. The release of hormones stimulates positive moods—without influence from the conscious mind.
9. Over the full course of a life the Self builds the personality, which can transcend the biological drives and in this sense become “immortal”. Self-determination is an indispensable prerequisite for shaping a life and developing one's own personality, and thus for happiness.

10. The sole purpose of the state is to ensure the personal freedom that allows the individual to unfold. It takes self-determination through to higher organisational levels; citizens form their state logically for themselves and are involved in it on a subsidiary level through direct democracy.
11. The prerequisite for an enabling state is enabled citizens and vice versa. Enabled means that they understand the problems of society as their own. The coevolution of enabled citizens and enabling state requires centuries. Enlightenment, self-determination and pluralism are its catalysts.
12. Enabling states form a union of states as propounded by Kant. States comprise culturally homogenous territories within which all is regulated by their constitutions. The dealings between states are regulated by treaties and movable structures.

The Concept of Uncompromising Humanism proves Lichtenberg's assertion that "Essentially ... all human beings could achieve fulfilment". The means to this end is reason, working from reality, understanding every human being as a purpose in himself and contributing to solving problems of society as one's own.

## The cycle begins

An essential aspect of the constitution of all living structures is the urge to exploit the possibilities of existence to the full. New kinds of organisms need to be ever more adaptable in order to live among the existing ones. The ultimate development of biological evolution is the phenomenon of “consciousness”, which has spectacularly expanded the existential possibilities of the human species. This is clearly demonstrated by human beings’ domination of the world compared with the mere survival of their ancestors. It is also evident that consciousness has not been a tentative, gradual development, but an evolutionary *leap forward*.

By virtue of its superiority, this consciousness collectively creates a world that is *above* nature, for which the instincts, which successfully guide other primates through their niches *in* nature, are never sufficient. Only the conscious can guide people through a world created by conscious beings. The crux of this is that the instincts are the same, and the conscious is at their service.

In order to ensure that a “jungle of ever higher refinements” does not arise, the conscious must transpose instincts to a human culture. Humanity is still a long way from achieving this. Real human suffering does not spring from faulty design of the species, but—a frightening idea given historical and present atrocities—defects in the shaping and development of the conscious.

The necessary knowledge is put forward by this Concept on the basis of what science has produced so far, such as what is life, a human being, free will, happiness. Scientific knowledge is derived from the



systematic questioning of what appears to be reality. Knowledge can only ever be obtained from such questioning. Philosophical work therefore starts with the incorporation of relevant knowledge: “The narrow gate that leads to wisdom.”<sup>Kant</sup>

Knowledge compellingly leads to an enabling form of organisation of human societies—in other words to one that offers all its members the framework for a fulfilled life. It also invites individuals to use this framework to the full. However, acquiring this knowledge depends on the will to do so, and putting it into practice requires self-control, both of which emerge from it. An enabling organisation also requires those knowledgeable, self-disciplined individuals—enabled individuals—who are its product. This desirable state therefore cannot be decreed, but can be catalyzed—by enlightenment.



Immanuel Kant, 1724–1804

### ***Dissociation from conventional philosophy***

Conventional philosophy starts from ordinary language concepts such as “justice” or the “meaning of being”. Kant even says derisively that it “gropes about concepts”. It does not care about reality, but about what philosophers have said. As the experiment is to science, so is the quote to philosophy. Philosophy seeks wisdom—a wisdom, however, that is not based on knowledge, but is a shot in the dark.

The hypotheses of philosophy cannot be proved scientifically—there are only philosophers, whose thoughts can be studied. They have published at least a million printed pages over the centuries, in which the majority—in line with the nature of such philosophising—are concerned with refuting others; some even turn their backs on their own published works. Thus even studying them all does not lead to universally applicable knowledge.



Ludwig Wittgenstein,  
1889–1951



Friedrich Hegel, 1770–1831

### *Structure of the concept*

The Concept of Uncompromising Humanism makes no assumptions about anything in advance, nor does it presuppose any specific knowledge. It proceeds on the basis of perception and comes to conclusions using intuitive logic which readers can reconstruct for themselves, including concepts such as the theory of relativity or the hypercycle (the origin of life).

Before Kant, and to Kant himself, it was taken for granted that philosophy was able to acquire all available knowledge. However, at the start of the 19th century science began to move at a speed that philosophers could no longer follow—and even if they did, they were soon left behind by the theory of relativity and quantum mechanics. They fell back on “the clarification of propositions”, *Wittgenstein* and some even resorted to mysticism, which is not what they should aspire to—rather, they should acquire the fundamental knowledge, move beyond it and perform their former tasks on the basis of this new, magnificent structure.

Consciousness radically expands the horizons of the conscious being—spatially, temporally and socially—especially as it includes the conscious being as the “self”. As expanded horizons offer both possibilities and threats, the consciousness has to interpret *everything* it perceives within them. If it lacks knowledge, it manages with assumptions and assertions; but as world history makes clear, it is knowledge that brings the greatest success. The selection criterion in the obtaining of knowledge is freedom from contradiction, firstly with regard to reality and secondly with regard to all verified knowledge. Ensuring the maximum possible freedom from contradiction serves two purposes, the force of a statement *and* its completeness.

The inevitable conclusion is that a model explains the whole or it explains nothing. It is only complete if it explains not only the world,

but also the thinking behind the explanations. Despite all attempts at didactic concentration, the quantity of knowledge to be processed for conclusiveness is extensive. This is not all—anyone who embarks on it will only know once they have made the investment whether it was worth it.

A closed circuit of statements? Sciences explain circumscribed reality in terms of circumscribed reality, and thus have by now built up an exponentially increasing, enormous body of knowledge; and yet no-one feels responsible for the consistency of the whole. Philosophers after Hegel have capitulated before the task, even sneering at those small-minded people who attempt it despite their warnings.

The basis for the Concept of Uncompromising Humanism is formed by the way in which the consciousness imagines the world to be; it ascends in stages towards the thinking that produced this imagining:

1. *A priori intuitions.*<sup>Kant</sup> Space and time ineluctably form the coordinate system in the human brain, within which it represents the world.
2. *Continuum, mass, cosmos.* A continuum logically and essentially fills the perceived space—from Anaximander to Einstein. In “deductive physics”\*, on which the model is based, mass is derived as the dynamic of an appropriately-specified continuum, and this continuum carries the expansion of the universe.
3. *Atoms, elementary particles.* The interaction of dynamics of masses produces interference phenomena that are the basis of all that is perceived. Elementary dynamics are structured into atoms, and atoms into inorganic molecules and, under appropriate circumstances, into organic ones.
4. *Life.* The huge accumulation of organic molecules on Earth led in a single event to a hypercycle of mutually-determining molecules: the basis for life. As far as is known to date, this has occurred only on Earth.
5. *Biological data processing.* In the course of evolution, the interaction between cells and cell structures was increasingly augmented by

\* Hans Widmer, “Essentials of Deductive Physics”, rüffer&rub Sachbuchverlag GmbH, Zurich 2014.

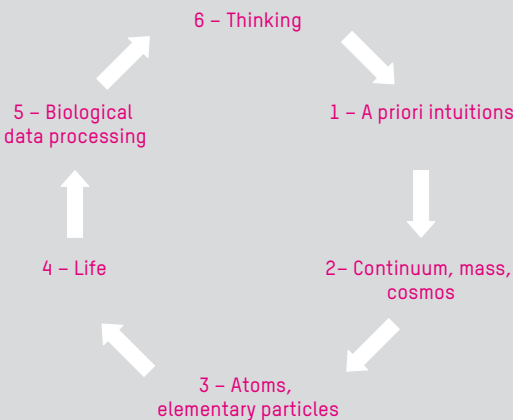
meetings between simple representatives of biochemical states— by means of signals in conductive pathways, ganglia, brains.

6. *Thinking*. Biological data processing gave rise to thought, which cannot avoid perceiving the world as a body in the coordinates of a priori intuitions.

The ontological circle answers the question “what can I know?”, with which Kant’s “Critique of Pure Reason” is concerned. However, beings with the benefit of consciousness do not have ontology as their primary aim, but happiness in their own lives. They demand answers to the kind of questions posed by Kant in his “Critique of Practical Reason”: “How should I act? What can I hope for?”, and to the question of how societies should be organised politically, economically, culturally. The basis for answering these questions is the certainty of the existence of *free will*. Kant postulated this without further ado, while current research into the brain questions it. The Concept of Uncompromising Humanism recognises it by its indispensable function, that of evaluating and selecting the solutions that thinking produces for the world, where instinct alone is not sufficient.

In the space opened up by free will the possibility of successful life emerges— “happiness”.

The Concept shows what successful individual life is and what leads to it, and also what are the conditions for it: the “enabling state” and its prerequisite, “enabled citizens”.



Ontological circle

Each presupposes the other, both are derived from the preceding stages and form the foundations for the postulation that “all people could be equally happy”.<sup>Lichtenberg</sup>

Each piece of scientific knowledge is based on a proposal that has “stood the test on the touchstone of reality”.<sup>Kant</sup> In the Concept of Uncompromising Humanism, this proposal is the whole. It passes the test, as each of its stages are proven science and each stage emerges strictly from the previous one. It thus becomes clear that knowledge is that which is built up by consciousness and not, as Plato would have it, items in an inventory of knowledge that predated humans, to which they gain access gradually.



Georg Christoph Lichtenberg,  
1742–1799

### ***Hyperstases***

The proposed Concept is confronted by two didactic challenges:

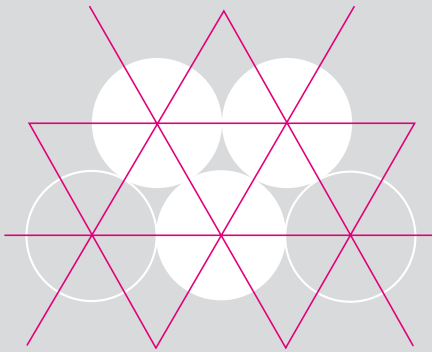
- A kind of uncertainty principle: the volume of knowledge needed for conclusiveness is incalculable; on the other hand, argumentation based on incomplete knowledge is not conclusive,
- The progression from one stage to the next.

Bypassing the uncertainty principle requires consolidation, visualisation and concepts such as *self-organisation*, *evolution* and *data processing*, which incorporate wide ranges of facts while at the same time retaining their essence. The quantity of individual items of knowledge does not prevent an overall picture from being gained, but is a prerequisite for it, as when completing a jigsaw puzzle.

In the difficult task of understanding the leaps from one stage to the next, it is worth recalling the following:

- A sandcastle is made from sand, but is not sand; it is a castle—something new that was not already present in the sand;
- A melody consists of notes, but its essence is not the notes;
- Life consists of molecules, but its essence is not the molecules.

Add to this the phenomenon of *self*-organisation; if a load of gravel is tipped onto a building site, the debris forms a cone; this occurs



of itself, as the cone was not thought out in advance. Similarly, if equal spheres are pushed against one another they organise themselves into equilateral triangles without any outside intervention. The Concept describes this self-organised evolution of the stages with the new term *hyperstasis*<sup>1</sup>: *hyperstasis* = *product of the self-organisation of a substrate*.

Self-organisation

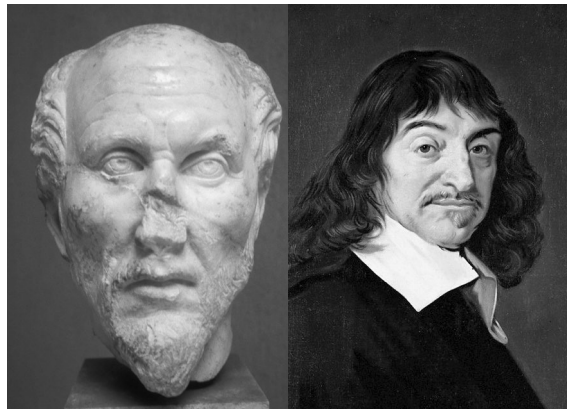
### ***Inexplicable basis—six hyperstases***

Human beings do not carry the world in their heads, but ideas of it, and the coordinate system for these representations are space and time. Anyone who, without any philosophical intention, asks what space and time are, will soon realise that it is impossible to refer them back to other concepts or to imagine they do not exist; they form the indispensable coordinate system for imagining the world. This insight renders unnecessary a range of philosophical questions, such as what is time or eternity, why anything exists at all and what is its purpose. Deductive physics removes the incompatibility between Einstein's theory of relativity and a priori intuitions.

*Hyperstasis I:* As a hurricane is formed from imbalances and consists of air and water yet is not air and water, but *dynamics* of them, so mass is the dynamic of the continuum. This is specified, while Anaximander's *apeiron*, Plotinus' One, Descartes' aether and Einstein's space-time continuum were only ideas. The mathematics needed to determine the behaviour of a continuum are field theories. All the major theories of inductive (conventional) physics are field theories, and they can be used to calculate, but not explain, the behaviour of everything from elementary particles through to galaxies.

*Hyperstasis II:* The combined effect of the dynamics of elementary masses leads again to something completely new: structures. This is because the rotation in space inherent in the dynamics of masses describes an axis (spin), an orientation which space, as a concept, lacks. At the lowest level in the hierarchy of stable structures are protons and neutrons, which in combination with similarly stable electrons form *atoms*, from which come *molecules*, and in favourable circumstances complex *organic molecules* (which are still not life). The science that describes the formation and cohesion of structures is called quantum mechanics. It arose of necessity from guesswork, however it evolves compellingly in deductive physics from the dynamics of masses, thus descending from the Olympus of the inconceivable in the same way as the theory of relativity.

*Hyperstasis III:* The essence of the leap to life lies in a cycle of structures, in which the positive of DNA is the blueprint for the negative and vice versa (hyper-cycle). In this way, the phenomenon of information enters the universe, on Earth according to the laws of nature, but apparently only a rare occurrence in the wider universe.



Plotinus, 205–270 ; René Descartes, 1596–1650

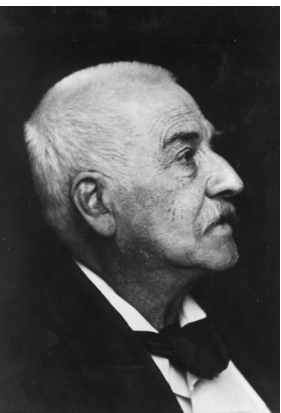
*Hyperstasis IV:* The combining of biological molecules into cells and of cells with each other is controlled by concentrations and differentiations: those which are to act on one another are in contact and those which are not are separated. The next great leap forward is to representatives of the forces emanating from molecules, to simple signals. This is the leap to *biological data processing*—the ultimate source of all intellectual activity.

*Hyperstasis V:* The essence of the leap from biological data processing to *thinking* lies in decoupling certain aspects of data processing and making them independent from forces driven by reflex and instinct. This decoupled data processing constructs an image of the world, which in the infant soon becomes so all-embracing that it contains the subject itself. Once again we have a cycle: the subject thinks—thinking produces the subject.

Humans cannot be explained by the laws that govern life alone. What constitutes humans, i.e. thought or, in other words, consciousness, distinguishes them from other primates not just by degree, but categorically. With consciousness a phenomenon enters the universe that is as new as life itself. Consciousness is that expansion of the horizon which is the source of all joy and sorrow, all hope and fear, all that is human.

With consciousness comes free will as a concomitant, not as an additional hyperstasis. Humans are not free to choose into which world they are “thrown”, and as what; rather, their freedom lies in the next step to be taken, and it is this freedom that they perceive. Similarly, “happiness” is a concomitant, of the physiological nature of learning: life-affirming intentions and experiences lead to the release of hormones that promote a positive mood.

*Hyperstasis VI:* The last of the hyperstases, culture, embraces innumerable human lives. Culture is more than the accumulation of individuals’ behaviour—it produces language, society, the state, economy, science, art, philosophy and re-



Jacob Burckhardt, 1818–1897



ligion. These are all self-organised over historical periods, developing from barely-differentiated beginnings into distinct independent cultures, although the substrate always remains the same: human nature.

Genetically, humans have not developed further over the timeframe of human history. This was the starting point, for example, of Jacob Burckhardt's description in "Reflections on History" of "humans, who remain unique, ... enduring, striving, acting, as they are, have always been and always will be". On the other hand, the religious, political and economic organisation of societies does evolve, defining the framework within which individuals, their consciousness and aspirations develop. Moreover, the 20th century saw substantial development of this framework with regard to human rights, democracy, education, health and welfare—despite all the century's retrograde barbarism. Nevertheless there is still a very, very long way to go before we achieve a culture worthy of human nature, that of "Uncompromising Humanism".



Robert Walser, 1878–1956

Humanism, to summarise, represents the striving for a way of life and social conditions that are worthy of our species. Humanism has been celebrated in thought and verse from Horace to the German Idealists of the 18th and 19th centuries, only to be most tragically defeated by reality: rather than high ideals, it was wars, genocide, communism, national socialism that prevailed. The celebration of the ideal subsided gradually, and more dramatically after the Second World War. The ideal of humanism was not a false one, but it is not enough merely to desire the desirable. "In matters of peace, talent and instinct play a more significant role than good intentions, which are of themselves totally characterless." *Robert Walser*

Uncompromising Humanism is the kind of idealism that begins with knowledge, the defining quality of humankind. Only that which has its basis in reality is viable—the idea of the world endorsed by the world. Proceeding from a priori intuitions to hyperstases, the Concept of Uncompromising Humanism inevitably results in the following: *in-*

*dividual happiness* need not fail any more than bold dreams, provided that human beings are enabled, know what there is to be known, and set their sights beyond the short term. *Societies are enabling* when individuals decide for themselves what is possible for them to decide; the same applies to the community, province, state; and states thus exist to serve the development of their citizens.

Since the Concept strictly follows reason, do its arguments not then lose sight of the “innermost being”, the “divine”, in each human being? Absolutely not, because reason

- provides a navigational instrument to help the innocent innermost being through the world created by human beings—the more viable the knowledge, the safer the path;
- teaches individuals not only how to find their way in the world but also to recognise and awaken the innermost being in its purity, wisdom and affirmation of life;
- in so doing reveals the divine in humans;
- shows the way, despite all the pressures and barriers that exist in the mind and in the world, towards the real, unfathomable, inalienable possession of a wise, stable, affirmative personality.



Horace, 65–8 BC

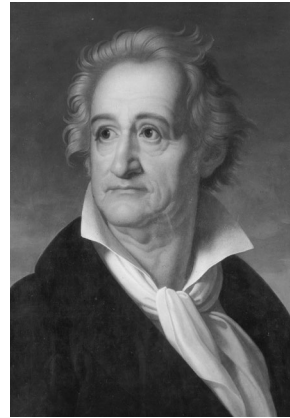
The difficulty here is that knowledge has to be acquired. If the love of knowledge in the world were as great as the love of God is in religious declaration, humanity would have progressed much further. In the words of Horace: *sapere aude* (dare to know).

# 1

## Unshakeable foundations of all knowledge: a priori intuitions

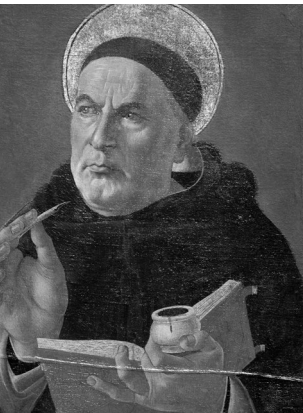
### *Reality and representation*

Ideas in the human brain are actively produced and are not mere reflections of the outside world. Visual images, for example, result from the processing of incident electromagnetic radiation. Just how synthetic the picture is can be illustrated by an operation in which the optic nerves of a chameleon are switched: afterwards, it directs its tongue in precisely the opposite direction from its prey. The illusion is perfect: the subject considers itself an impartial witness of the presence of objects and demonstrates, as a matter of course, total reliance on the constructed picture. Goethe, on the other hand, in observing nature, constantly asked himself the question, “Is it the object or is it myself that is being expressed here?”



Johann Wolfgang von Goethe,  
1749–1832

A photograph requires photographic paper, the molecules of which react specifically to wavelengths of incident electromagnetic radiation, for example to 400 nanometres for the reflection of violet light. However, the Mona Lisa can also be represented by the appropriate planting of grass in a field, or the course of a road can be drawn in the sand using the big toe. A substrate is required *for* a picture, and it is irrelevant what this is in itself; but *in* the picture there has to be order among the pixels. In a photograph, for example, there are no spatial relationships, but only two-dimensional ones, which the eye reconstructs into objects in space based on the laws of perspective.



Thomas Aquinas, 1225–1274

A drawing in the sand (“here is Rome and here is Paris”) implies scale and a north-south axis; the sequence of images in a film requires the addition of a temporal order.

This is true not only for visual images, but for all ideas—however the human brain constructs its pictures, they have to offer reliable help in our perception of the world. Thomas Aquinas sums it up perfectly: “An object in the mind is adopted according to the mind—and not according to the object.”

If it is understood that

- space can only be experienced through movement—and therefore in time; time similarly only through movement—and therefore in space;
- only bodies can have such “experiences”,
- bodies are characterised by the fact that they are permanent (in time) and impenetrable (in space),

this is no circular argument in which the hypothesis already contains that which is to be proved, but rather an expression of the nature of the process of representation which is only concerned with the correspondence of relations. Bodies, space and time are not reality, but the phylogenetically-provided means of producing an idea of reality.

The fundamental and literal impossibility of grasping time and space led Kant in 1781 to introduce the concept of “a priori intuitions” to philosophy: “Space is not experience, for all spatial experience assumes the idea of space.” And “Time is nothing other than the subjective condition under which all intuitions can take place within us.”

Kant had trouble with “matter”, or “substance” as he called it. He did put forward a “principle of the permanence of substance”: “All appearances are in time ... In [them] the substrate must be found ... [which] is permanence ... Therefore in all appearances, permanence

is the object itself ...” He did not, however, establish the link between substance and space (impenetrability) that is analogous to this substance-time relationship (permanence). He lacked the concept of atomism which sees all matter as made up of the smallest units, and was therefore unable to classify substance in its “multiplicity of appearance” as an a priori intuition, although he wrote about it as if it were possible.

It is not surprising that Kant had difficulty with the concept of substance, for physics is equally unable to define what substance in the sense of “mass” is. One knows how “heavy” a mass is, in the material sense, from the pull the Earth exerts on it—mass multiplied by gravity—and how “inert” it is by its resistance to acceleration—mass multiplied by acceleration. When equating the two, mass is removed so that acceleration is equal to gravity, which is the same for all objects of any mass, from goose feathers to lead bullets. This only establishes the gravitational field of the Earth, that is the interaction of masses—not what mass actually *is*.

Physics simply treats mass as a given and uses its behaviour to derive force fields, which are mathematically expressed in field theories. All field theories contain a continuum, in Einstein the “space-time continuum”. Thus, conventional physics proceeds from this inductively, namely by inferring a continuum from the phenomenon.

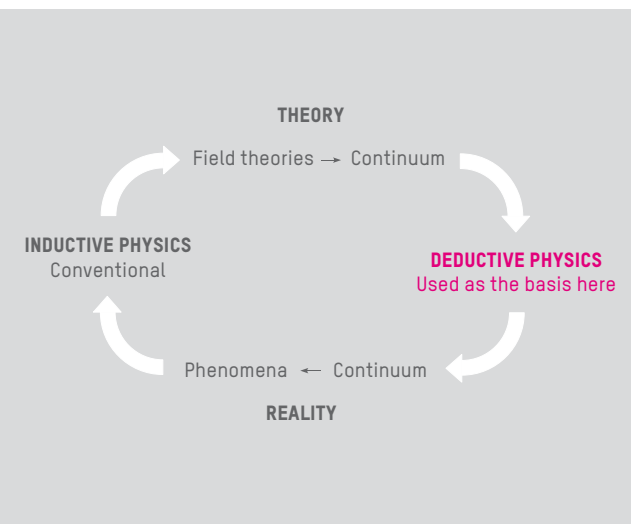
Deductive physics takes the opposite route, from the continuum to mass as the dynamic of it. The constituents of this continuum are pure bodies, defined as permanent, impenetrable volumes, the opposite of empty space and characterised by nothing else, which is why deductive physics adds “body” as a third a priori intuition in addition to those of “space” and “time”. Hence, all that is needed for the representation of the material world is the system of coordinates covering time and space, and the bodies within it, all material phenomena being derived from them.

The three a priori intuitions have a correspondence in the three fundamental physical constants, which would confirm philosophy as well as science in their claim to be the basis for all knowledge—if a century ago the theory of relativity had not come up with ideas

that declared a priori intuitions invalid: with time being stretched, space being stretched and curved, and with mass increasing as its own speed increases, tending to infinity at the speed of light.

The triumphant proof by experimentation of Einstein's predictions undermined philosophy, and in order to regain a firm footing it is necessary to get to grips with the theory of relativity. As children begin their development without consciousness of space and time as dimensions independent of their own existence, the first thing to be observed is how this emerges as a capacity for abstraction and objectification.

What are the benefits to a person of knowing how matter can be thought about? Firstly, the natural reflex of wanting to have everything explained is satisfied. It can be built on, and an explanation for "life" found in a few steps. It is now possible to understand "intellect", the essence of which, although it may go beyond matter, is nevertheless a structure of matter. Finally there comes freedom from all speculation, freedom to construct one's idea of the world on the solid foundation of recognised laws.



Deductive Physics

### ***Acquiring space-time concepts***

With freedom of movement comes the need to explore the space where it occurs. Here it is only a matter of distinguishing between “space” and “impenetrability”, not of what the impenetrable barrier *is*.

Infants’ first experiences of touch establish impenetrability: is there a body in the way of the hands or not? Playing with wooden bricks teaches them that two objects cannot occupy the same space at once, and conversely one cannot be in two places at the same time. By the age of eight months they have internalised the concept of permanence; if an object is covered they look for it, whereas previously they would simply have turned their attention to something else.

At first, space manifests itself only as the distance from the child to an object; later the perspective widens with the awareness of differences in length. Time is initially understood in terms of earlier and later, faster and slower, longer and shorter. If one of two trains running on parallel tracks in a model railway is faster than the other, a toddler will see it as going further, without the ability to express the idea that it will arrive at its destination sooner.

Children cannot conceive of objective time and objective space, both existing independently of the child’s own presence, until the age of seven or eight—and from then on they can never again imagine them not existing. They are inescapable, and yet philosophy was stalled in 1919, when an experiment during the solar eclipse in England confirmed Einstein’s mathematics, which he construed as a sequence of the stretching and bending of space and time, something which from the perspective of deductive physics is unnecessary.

### ***Fundamental constants***

Inductive physics represents the material world in space and time, but instead of the “body” dimension it relies on “mass”. It defines mass in terms of a specific *volume* of a specific substance: a litre of water is a kilogram, and all substances that are similarly inert and heavy are the same.

All statements made in physics are stated using the three dimensions of length (for space) in metres,  $m$ , time in seconds,  $s$ , and mass in kilograms,  $kg$ . Electricity is linked to mass by means of the dimensionless fine-structure constant  $\alpha$ , and does not represent an additional dimension. Also, as physics uses three dimensions to express itself, there are three fundamental constants<sup>1</sup>:

$c$ , the speed of light  $\frac{m}{s}$

$G$ , the gravitational constant  $\frac{m^3}{kg \cdot s^2}$

$\hbar$ , Planck's constant  $\frac{m^2 \cdot kg}{s}$

Metres, seconds and kilograms are arbitrary measures: a 40,000,000th part of the equatorial circumference, an 86,400th part of a day, the inertia and weight of a litre of water—while in contrast the fundamental constants  $c$ ,  $G$ ,  $\hbar$  are facts, and are what they are independently of the measurement units of physics. If they had different values, the world would look different: elementary masses would be larger or smaller, or there would be none at all. Gravitation would be so strong that all celestial objects would be drawn together into a single lump, or would be so weak that nothing would hold together. Quantum mechanical interferences would be so weak that electrons would fall into their atomic nuclei, so that no molecules and no life could arise, etc.

As in deductive physics the fundamental constants are the properties that determine the continuum in space and time, and as all materials are derived from the dynamics of this continuum, all phenomena are based on a priori intuitions and therefore assumed “according to the mind”. *Thomas Aquinas*

Space and time coordinates run to infinity, revealing their nature as concepts. On the other hand, the universe as portrayed within these coordinates is seen to be finite. In retrospect the two giants can be reconciled: Newton’s “absolute space” and “absolute time” relate to



the coordinate system of all representation, while Einstein's "absolute speed of light" relates to the continuum represented within it.

### *Irritation from the theory of relativity*

Kant's a priori intuitions are the most fundamental examinations of thought that philosophy has produced, but at the same time they are the most persistently refuted: thinkers are constantly putting forward new speculations, in particular about the nature of time.

In 1905, Einstein introduced the terms "expansion of time", "time dilation" and "space-time continuum", adding "curved space" ten years later, thus causing bewilderment and relief in equal measure: bewilderment for those who believed they understood the concept of a priori intuitions; relief for others as there was now something much more inconceivable, so it must be the truth.

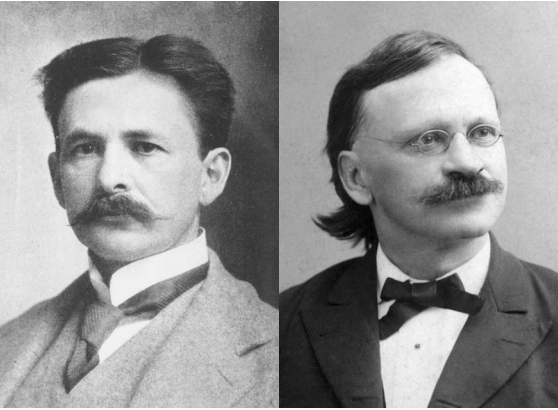
The special theory of relativity goes beyond any intuition right from the start of the derivation: a "four-vector" is first introduced for spaces, then rotated around an imaginary angle, and later it is concluded formulaically that impulse is also a four-vector (with time in the fourth dimension)—and after a chain of abstract operations,  $E = mc^2$  is obtained. A professor\* at the Swiss Federal Institute of Technology (ETH) once said to his students, "You go through it step by step, accept what emerges, and understand nothing. No-one understands it."

In his lectures at Princeton in May 1921, Einstein made fun of the fact that physicists had been obliged to "bring down ... the concepts of time and space ... from the Olympus of the a priori ..." He was apparently confusing "a priori" with "absolute" and failed to appreciate that Kant's a priori intuitions identified a more radical relativity than his theory of relativity, i.e. that between thought and reality—not merely that between two bodies moving relative to one another (special theory of relativity) or interacting with one another (general theory of relativity).<sup>2</sup>

Knowledge grows from the resolution of contradictions, and the contradiction first resolved by Einstein was this: if a source of

\* Jakob Ackeret, 1898–1981; physicist, pioneer of fluid mechanics; proposed the term "Mach number".

light moves towards an observer at speed  $v$ , and the light is moving away from the source at the speed of light  $c$ , the observer intuitively expects an arrival speed of  $c + v$ . But in the 1880s, it was determined by measurement that the velocity was  $c$  in all circumstances



Albert Michelson, 1852–1932 ; Edward Morley, 1838–1923

(Michelson and Morley). How did Einstein resolve this contradiction? His very first step contains all the irritation of the later results: he said to himself that if the speed of light is to remain constant at  $c$  regardless of the position of the observer, then distance and time simply have to be “relativised”. Instead of Newton’s space and time, he therefore proposed  $c$  as the absolute. He then tested out how a system of coordinates  $K'$  with its origin in the light source would have to relate to the observer’s system of coordinates  $K$ , to enable light both to be emitted from there at  $c$  and to be received here at  $c$ .

His conclusion was that space and time are contracted around the light source, but the consequences go much further: mass increases as  $v$  increases and thus also the momentum (momentum = mass multiplied by velocity). A momentum<sup>3</sup> has an energy and a cross-multiplication supplies directly the result of the century—that this energy is not zero, even at rest, but the famous  $E_{rest} = mc^2$ .<sup>4</sup>

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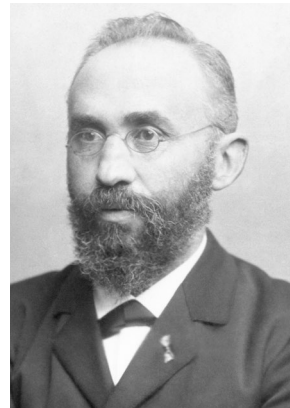
Einstein would have been severely taken aback had he realised that his result originated in Newton’s formulation of the momentum conservation law: if Newton had simply written “force equals mass multiplied by acceleration”, Einstein would not have made such a leap forward. He was merely lucky, since in 1905 there was as yet no experimental proof that Newton’s intuitive formulation applies.<sup>5</sup> But even leaving this aside there was great cause for amazement as kinetic energy was now to be understood as a pure increase of something that no-one

had bargained with: rest energy  $mc^2$ . It is an indication that that mass is a dynamic, not a corpuscle.

The simple reason for this, that light from any source is radiated at  $c$  and received by any mass at  $c$ , regardless of whether they are moving relative to one another, depends from the point of view of deductive physics on the fact that

- the continuum directly on the surface of a mass is at rest (in the same way that air is at rest on the outer ear despite the strongest wind—it does not blow into or through the ear),
- the speed of propagation of all disturbances (such as waves) in a continuum at rest is  $c$ .

However the frequency of lightwaves hitting the observer should not merely be expected in terms of linear addition (the original quantity of signals per second plus the gain from the approach<sup>6</sup>), as the field of a mass, spherical when at rest, is contracted if it moves at  $v$  relative to the continuum—like a source in the countercurrent. This shortens the wavelength of the radiation by the factor known as the Lorentz contraction, and the frequency is increased in inverse proportion, which leads to the Doppler effect<sup>7</sup>, in which the frequency increases at more than a linear rate, and for  $v \rightarrow c$  becomes infinite (approximately corresponding to a sonic boom). This enables all the results of the special theory of relativity to be understood and also some of those of the general theory of relativity, if kinetic potential is replaced by gravitational potential in the formulae. The assumption of a continuum and the representation of a mass dynamic within is therefore sufficient to avoid the concept, incompatible with thinking, that space and time can expand and bend.

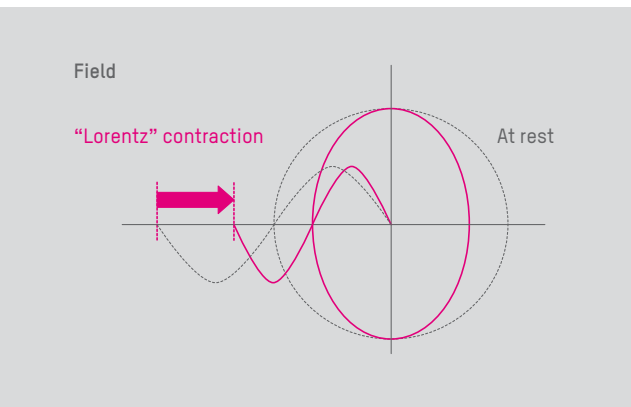


Hendrik Antoon Lorentz,  
1853–1928

The predictions of the theory of relativity are true, but Einstein's interpretations of the correct mathematical results as the expansion of space and time should be replaced:

- It is not that the time of the mass in motion moves more slowly, but that its signals take longer to reach the observer,
- Space does not expand or contract, but the continuum in space, similar to the air that flows around a body,
- It is not the mass that increases with velocity, but its effect—similar to the pattering of rain at high speed against a wind-screen,
- Mass should be thought of as a dynamic, as compelled by  $E = mc^2$ , and the idea of literally inconceivable corpuscles should be abandoned.

Ultimately, the theory of relativity only formalises the relativity of interactions: as a motorbike approaches a listener, the listener registers higher-frequency sounds, and as it goes away, lower. The theory of relativity does not offer anything else to philosophy, although it introduced a new era in physics.



Lorentz contraction

## *Irritation from quantum mechanics*

As an infant's consciousness first begins to develop, there is an undirected movement of the limbs until an effect is achieved; after several repetitions this is then stored as an action-effect pattern. The action does not result from a physiological need, but a reflex that trains the brain. The pattern contains the idea prior to the triggering of the action, in the same way as a bird "imagines" the landing before settling onto a branch.

In this way, infants register their own intentions, and at nine months children recognise their intentions to such an extent that they can also recognise those of other people. Others are understood *per se* as intentional beings with intentions analogous to those of the child. This is manifested in the form of pointing to things and persons, in other words in attracting people's attention, something that is not observed even among the most attentive of the other primates.<sup>Tomasello</sup> By analogy, children later attribute intention to all processes, saying things like, "The ball wants to come to me" and seeking intention everywhere: "Why does a cherry tree want to blossom?" Theories of cause are also stated: "The moon shines so we can find our way home." The history of ideas began in similar fashion: mythologies invented beings with intentions in response to questions of cause and purpose; religions responded with creation stories.

A child of western civilisation gradually learns to transpose intentionality into causality and explain reality from reality. This was the giant step forward made by the pre-Socratic philosophers with the causality principle: "Everything has a cause" and the law of cause and effect: "Equal causes have equal effects".

One of the first experiences of causality a child encounters is that a body which was there first must be removed if another is to take its place. Kant considered causality to be a priori; however, it is not to the extent that, in the final regression, it is attributable to the fact that space can only be occupied by *one single* body, and so is already contained in the three a priori intuitions of space, time and body. Causality describes sequences of conditions, of stationary images, the

earlier of which are termed causes and the later, effects. The stationary images are subjective constructs—considered objectively, “everything is in a state of flux”, one thing flows from another, and in this sense everything that happens is from the outset “causal”.

At the start of the 20th century physical experiments were advancing into atomic dimensions, revealing an acausal, inexplicable world. In the 1920s a handful of brilliant physicists developed quantum mechanics, with which all the probabilities and inexplicable conditions could be calculated—but not explained, for which reason the uncertainties are stated to be objective and the probability calculations raised to the ranks of fundamental laws of nature. The expectation of causality at the root of all phenomena was challenged. Philosophy was dumbfounded, and conventional physics was expanded by a further colossal dimension in addition to the theory of relativity.

In deductive physics, all quantum-mechanical facts arise from interferences of the waves that are emitted by masses and transmitted by the continuum. The specific values are shown to be resonances—like the vibrations in musical instruments—and the uncertainties consequences of the fact that interactions occur in waves and it cannot be determined precisely where the masses from which they originated were located in the wave. Deductive physics thus explains all phenomena causally, yet the information on an atomic scale is never sufficient for more than the calculation of probabilities, for which quantum mechanics provides the perfect instruments.

Philosophers have used the quantum-mechanical facts to perform “bold works of genius”, *Kant's expression* going as far as an explanation of free will, although quantum phenomena are no more significant than others that can only be determined statistically, such as the behaviour of gas molecules (thermodynamics) or traffic. In everyday life there is much that appears to be acausal, or “chance”—we meet a neighbour in a remote place, or lightning strikes. The chance element here is that we had not taken account of our neighbour's trip round the world or of the electrical discharges from the sky. Both had causes, but neither had any kind of intention, concepts that are easily confused in everyday life. The thermal movements of the individual molecules