

1. Introduction

After elucidating the refined observations made in our time, the majority of physicists agrees that apparently no fundamental difference exists between the energetic and material phenomena in the universe: both show a particle- and wave-like character and seem to be interchangeable. This result of evaluation is still difficult to accept, but it was not the only confusing problem to solve.

One of the main controversies, physicists have met, involves the evaluation of photon behaviour with respect to speed. Rules of logic demand that the velocity of a coherent substantive entity (a thing) within a system adds up with the speed of the system itself, with respect to an observer outside the system, as far as the directions of these velocities match the direction of observation. According to accurate measurements it is impossible to apply these rules to photons: the value of light velocity is a constant! Thus it seems logically to state that a photon cannot be such a thing. However, this again contradicts the particle character, claimed for photons by Newton and Einstein.

The chosen scientific solution was a mathematical one. One incorporated the problem in mathematical formulas without finding a logical explanation for the problem, thus probably waiting for renewed problems in the future.

Indeed, it is most likely that some kinds of particles rule the transfer of forces at a distance. The influences of extra galactic systems on each other over millions of light years may be imagined as influences between atoms or even between nucleons. A dilution of any kind of transferring substance to such an extent is unthinkable, unless it is imagined as a flux of fast moving particles, emitted by a large number of sources. Moreover, the inverse square-distance proportion of electrical and gravitational forces are pleading in advance of particles.

An other controversy arises with a fundament of conventional mechanics, namely the coupling between force and mass ($f = m.a$). Now we are convinced of the fact that transfer of momentum and angular momentum does not take place by direct touch (collision) of material systems, the question how mass supports the exertion of force on a distant mass is even more cogent. Maxwell's laws cannot give sufficient solace, because mathematics cannot replace the mass-action that must be present at the place and the moment of force exertion on another mass.

The extremely unbalanced positions, occupied by the related fundamental particles, the electrons and positrons, form a third object of doubt. Many of the physicists think to have found an explanation in a hypothetical event at which almost the whole primeval

universe changed into radiation, except the now existing electrons. They consider the recovery of positrons and electrons from high-energetic radiation and from nuclei at nuclear reactions as the reverse of the annihilating reaction. However, it is hard to believe that the whole material universe should be the trifling remains of an almost complete annihilation in the beginning of time.

Another difficulty raised with the formulation of the uncertainty principle by Werner Heisenberg in 1927: $\Delta(m.v) \times \Delta x \geq h$

with $\Delta(m.v)$ = uncertainty of momentum and Δx = uncertainty of place.

This principle became a fundament of modern quantum mechanics, but one should be aware of the fact that the relation has been derived from the revolving systems of atoms. The solution of problems, resulting from that principle, must be found in its derivation. The continuously differing positions of ec's in nucleons, resulting in wavelike movements of orbiting ec's, reveal a constant compromise between the distances of application-centres of electric forces to those of the inertial forces. That may be a fundament of the uncertainty principle (§ 3.5.3).

One of its problems is the abandoning of the principle of causality (fundament of conventional physics) by many of the physicists. Not by Albert Einstein, however, although he was one of the leading representatives of the symbolistic (pure mathematical) approach. His famous statement: "Der lieber Herr Gott würfelt nicht", speaks volumes.

I feel supported by the intuitive tightfistedness of Einstein with respect to causality. In the next chapters I will use this principle in an attempt to find a new approach to the phenomenon of force exertion at a distance, and by doing so, to bridge some of the gaps that still are open in modern physics. The development of a new look at that subject is important, because it concerns the very fundament of the material existence of the universe.

In order to find a new way to look at the field of forces and its relation to matter, I shall take the following considerations into account.

a/ Einstein's basic statement about light velocity may not have been fundamental enough. The constancy of that velocity may be explained in an other way. To that purpose the properties of a mediating entity, exchanging energy between material systems, can serve. Therefore the rejection of the particle image of photons is necessary. A photon appears as an energetic event. This event happens when a material system selects that part of the mediating entity, which converges into the system with the velocity of light, neglecting those parts that converge with other speed.

- b/ The mediating entity must represent a potential energy.
- c/ The potential energy of an electric field must be positive as well as negative, because equal charges recoil and opposite charges attract each other.
- d/ The power to exert a force on a distant mass is inversely proportionate to the square of the distance.
- e/ The sources of the mediating entity of any field can only be found inside matter.
- f/ Only the connection between the elementary charges and the electrical fields is clear. The other fields attach in an inscrutable way to complex systems of moving particles. Conform these considerations the following theses about the mediating entity for the transport of energy are proposed.

Basic theses concerning forces between material systems

1. The transport of energy through space happens by means of a flux of **energons** or power particles (**pp's**).
2. Electrons and positrons (**ec's**) produce the energons, which implicates the existence of two kinds of **pp's**. Each kind consists of two poles with opposite properties (positive and negative), rotating around each other left- or right-handed with respect to the direction of emission, depending of its source.
3. Matter consists exclusively of dynamic systems of elementary charges.
4. Huge numbers of **pp's** (**Spp's**), being permanently in creating or annihilating reactions, form the **ec's**. With these reactions two **pp's** screw out or in the point of action (**P_A**) with the velocity of light (**c**).
5. Only the **ec-mantle** can emit **pp's** into the inner and outer space. The points of action **P_A** can have at most the relative velocity **c**, thus maximally $\pm \frac{1}{2}c$ with respect to the **ec-mantle**. Therefore the emitted **pp's** must have velocities between $\frac{1}{2}c$ and $1\frac{1}{2}c$ with respect to the **ec-surface**. Each velocity occurs evenly often and the probability of creative actions is equal for the diverse **P_A**-velocities.
6. The diameter and the intensity of **pp**-emission of **ec's** are pulsating, meaning that the maximum velocity (**vs**) of the surface with respect to the **ec-centre** contributes to an extra velocity of emitted **pp's**: $c \pm \frac{1}{2}c \pm vs$. A positive velocity (**+vs**) causes a lower **ec**-density with a higher **pp**-emission. A negative velocity (pointing to the **ec-centre**) is coupled with a higher **ec**-density and a lower **pp**-emission. The **ec-surface** emits the **pp's** as being in a relative slow rotation around one axis (**ec-spin**).
7. Energons, coming in with velocity $(c \pm \frac{1}{2}c)$ generate their own point of action in the **ec-mantle**. They can only react with **Spp's** in **P_A** at velocity **c** with respect to that point. An attracting force (negative) results, if the reacting **pp's** and **Spp's** have an equal

rotation in absolute sense. If the rotations are oppositely, the force exertion is recoiling (positive). With these reactions an absolute amount of energy ($\pm e_0$) will be induced in an absolute period of time (t_0). A negative force exertion belongs to a negative energy and a positive force exertion belongs to a positive energy.

In this study the foregoing theses form the base of the so called **energon hypothesis**, which tries to tell a new story about the exchange of forces at a distance by the *ec*'s at diverse states of relative movement.

Point 2 supposes the existence of two opposite poles forming the energons. The sum of energy of both poles must be zero, but the angular momentum does not vanish. This makes that the values of mass and length, *as well as of time*, must have an opposite sign in order to describe the situation properly. The energy is described by: $(+m).(+l)^2.(+t)^2 \rightarrow (+)$, or by: $(-m).(-l)^2.(-t)^2 \rightarrow (-)$, and the angular momentum by: $(+m).(+l).(+t)^{-1}.(+r) \rightarrow (+)$, or: $(-m).(-l).(-t)^{-1}.(+r) \rightarrow (+)$. The force does not vanish either: $(+m).(+l).(+t)^{-2} \rightarrow (+)$ against $(-m).(-l).(-t)^{-2} \rightarrow (+)$, which is in accordance to the idea that annihilation of energons is accompanied by force-exertion.

The opposite value of time means that one of the poles must exist in the near future and the other evenly far in the past . The creation of a pole-antipole twin looks like the creation of a real image pair in spacetime and anti-spacetime.

Item 5 includes: *No entity can have a larger velocity than c with respect to its source.*

So, the points P_A can maximally have the relative velocity c , but no more than $\pm \frac{1}{2} c$ with respect to the *ec*-mantle, because the values must be equally. The *pp*'s have the velocity $\pm c$ with respect to P_A or $\pm (c \pm \frac{1}{2} c)$ with respect to the *ec*-surface.

The supposed dynamic *ec*-frame of the nucleons offers the opportunity to combine the properties of the *ec*'s, namely charge and spin, with the inevitable phenomenon of **ec-conjunction** with respect to an outside observing system. It will be shown that this combination enables the deduction of the **force of gravitation**, as well as the calculation of both the constant of gravitation and the energy quantum of it.

It will be explained that the spread of *pp*-velocity (point 5) is leading to **pp-convergence** into each point of space-time and with that to the emergence of **magnetism** with moving *ec*'s. The exclusion of *pp*'s from reaction with *Spp*'s, if the *pp*- velocities are below $\frac{1}{2} c$ or higher than $1\frac{1}{2} c$ with respect to the *ec*-mantle (points 5 and 7), leads to the phenomena of **relativity** : the increase of forces at moderate velocities and the decrease at high relative velocities between *ec*'s. The combination of these phenomena leads to a *minimal distance* between *ec*'s outside the nucleons, as will be described.

The phenomenon of **ec-spin** is thought to arise as a compensation of a loss of angular momentum of *pp*'s emitted with an oblique angle to the *ec*-surface. This compensation includes an altering of the *pp*-axes into the outside as well as into the inner space along the big circle through the uttermost angles of the direction of emission.

The concepts of *pp*-convergence, **ec-pulsation** and **specific conjunction** lead to discrete distance-levels between *ec*'s in rotating systems, and with that to a relation between the energon-hypothesis and **quantum-mechanics**.

According to the energon-hypothesis **photons** have to be seen as energetic events. The constant velocity *c* at which the *EM*-signals must be received is ascertained by the receiver. This causes the existence of **the eros of c**, an *effect of related observations at speed-difference*, meaning a difference in *c*-observations by a rotating system.

The value of **Planck's constant**, describing the exchange of energy-quanta, has been deduced from the energon hypothesis and its data. *The conclusion must be drawn that the distance between the mass- and electric centre of the ec's plays a fundamental role in this constant.* The discrepancy between the forces, working on both centres, leads to a restoring factor formed by the ratio between the centres-distance of an *ec* and the distance between the interacting *ec*'s.

The expansion of the universe may be caused by the *pp*-emission of the *ec*'s: only about 4.5 % of the *pp*'s is annihilated at the exertion of forces, the rest of it may form the physical space, keeping averagely a distinct distance to one another.

Finally, the known formula for gravitation ($f_G = G \cdot m_1 \cdot m_2 / A^2$) has to be modified according to the energon-hypothesis. A factor of tolerance and a factor of expansion must be added, which cause a **gravitational barrier** at distances between 10^3 and 10^6 light-years: the increase of gravity to about 100 times its 'normal' value may have caused the partition of stars into super-clusters, clusters and single galaxies.