

APPENDIX DOCUMENT B1.3: SIX LAWS BIOCHEMISTRY LIVING MATTER IN THE UNIVERSE

APPENDIX 1: UNIVERSE-WIDE ALL MATTER / ATOMS IN ACCORDANCE WITH THE ELEMENTS OF THE PERIODIC TABLE:

-1) All matter in the universe is build up from just *four Higgs particles*

In the whole universe all matter is based on just *four super symmetrically Higgs particles, strings, snares.*

- Two super symmetrically proton Higgs particles and
- Two super symmetrically electron Higgs particles.

These proton Higgs and his anti-proton Higgs particles cannot annihilate! The same for the two electron Higgs. So **Einstein's** $E = mc^2$ isn't valid on the mass level! See **document F1a 2014 and figures Higgs/ strings/ snares / branes** www.uiterwijkwinkel.eu .

-2) Those for Higgs just results in the construction of protons and electrons:

With those two proton Higgs and two electron Higgs particles only neutrino's, photons and ordinary protons and electrons are to construct; the only two building blocks of atoms (1 neutron = 1 proton + 1 electron). That process is explained in detail in the **documents F1b and F1c + figures.**

Those two basic building blocks of atoms first just results in the formation of just hydrogen atoms / molecules and nothing else. The atoms of the periodic table are generated after nuclear fission of hydrogen during the Big Bangs at the start of galaxies some 20 billion year ago (**Phase 16 cycle of the universe G7 and figures 42 – 54 G8**).

-3) In atom cores no neutrons are present:

For energetically reasons fission of hydrogen (1 proton + 1 electron) exclusively results in ordinary atoms conform the elements of the periodic table. See **document F1d and figures.** Atomic nuclei don't contain *neutrons* but are exclusively constructed out of protons and 'core'-electrons and 'shell'-electrons!

The neutron consist of one proton and one electron. In the atom core this electron of the neutron is always bound to at least two protons and never to just one proton! Thus in atom-cores neutrons are technically impossible! The structure of atomic nuclei without neutrons is worked out in the figures related to **F1d**. See the figures.

For the physical, chemical and mechanical forces of atoms see **appendix 2**.

-4) Black hole atoms and antimatter:

Except hydrogen, helium and lithium all other atoms can collapse to a black hole condition and transfer into blackhole atoms. For these atoms and their forces see **document F1e and figures.** Black hole atoms form compact celestial bodies such as black holes.

In the universe antimatter, anti-protons, anti-electrons and anti-atoms are absent.

-5) The elements of the periodic table form 6 groups of elements and in fact just four groups:

Nuclear fusion starting with hydrogen results in more than approximately 100 different stabile elements and a multitude of unstable isotopes. Radioactive decay proceeds to approximately 90 stable elements divided into 6 groups:

- 1) The metals (+ m +),
- 2) The amphoteric metals (+ m-),
- 3) The metalloids (-m +),
- 4) The halogens (-m-) and
- 5) The chemically inert noble gases (+ m +)
- 6) the H-atom (+ m +).

The H-atom has completely unique features but still seems the most like a metal (+ m +).

Noble gases respond only under extreme conditions and react than likewise as a metal (+ m +).

So all elements are eventually part of only four (digital) groups:

SCHEDULE 1: THE DIGITAL ELEMENTS OF THE PERIODIC TABLE:

- 1) The metals (+ m +),
- 2) The amphoteric metals (+ m-),
- 3) The metalloids (-m +) and,
- 4) The halogens (-m-) and

APPENDIX 2: THE 12 FUNDAMENTAL FORCES ELEMENTS PERIODIC TABLE:

In **document F1d** the author has systematically derived the *12 universe widely found fundamental forces* on atoms and elements of the periodic table. The physical and chemical bonds of those forces are set out in detail in **document D1** www.uitewijkwinkel.eu .

SCHEDULE 1: MAIN COMPARTMENT OF FORCES:

- A) 2 elementary forces; electric charge and magnetic spin,
- B) 1 sub-elementary force,
- C1) 2 mechanical forces of the atom,
- C2) 1 gravitational force, generated by the 'shell' electrons of atoms,
- C3) 2 physically forces of atoms; one generated by the single 'shell'-electron and one by the 'shell'-electron pair,
- C3) 2 chemically forces of atoms; one generated by the single 'shell'-electron and one by the 'shell'-electron pair
- D) 2 temperature related forces.

SCHEDULE 2: THE 12 FUNDAMENTAL FORCES ON THE ATOM:

Ad A) 2 elementary forces of the proton/ electron:

- 1a) The elementary charge / charge force of the proton: $(+Lef p+1)$,
 - 2a) The elementary magnetic spin force of the proton: $(+Mesf p +1/2)$,
 - 1b) The elementary charge / charge force of the electron: $(+Lef e-1)$;
 - 2b) The elementary magnetic spin force of the electron: $(+Mesf e +1/2)$ and
- These most elementary forces are generated at the most elementary Higgs, snare, string level.

Ad B) 1 basic power related to the structure of the atom:

- 3) The centrifugal force 'shell'-electron in an orbit around the atomic nucleus: $(+Cpf e)$;

Ad C: Forces related to speed of atoms in the universe or change in speed or direction:

C1) 2 mechanically forces linked to the atomic nucleus:

- 4) The acceleration/ deceleration (velocity) force of the atomic nucleus (a): $(+Vf n+)/(+Vf n-)$,
- 5) The centrifugal force of the atomic nucleus (a): $(+ Cf n)$;

C2) 1 Basic (speed) power of the 'shell' electron and 'shell' electron pair:

- 6) The gravitational force of the 'shell' electron (1)/ electron pair (2): $(+ G1f)/(+ G2f)$,

C3) 2 chemical and 2 physical forces associated to the 'shell'-electron (1)/ electron pair (2) in orbits around the atomic nucleus:

- 7) The chemical covalent radical force of the single 'shell'-electron (1): $(+ R1cf)$,
- 8) The (bio) chemical covalent charge/ charge force of the electron pair (2): $(+ L2cf)$,
- 9) The physical / chemical charge/ charge force of the electron (1): $(+ L1f)$,
- 10) The physical van der Waals/London force generated by a 'shell' electron pair: $(+ W2f)$,
- 10a) Atoms / molecules with flexible (fl) van der Waals / London bonds are liquids; $(+ W2flb)$,
- 10b) Atoms / molecules with fixed (fi) van der Waals / London bonds are solids; $(+ W2fib)$
- 10c) Molecules with van der Waals / London force without binding are gas / plasma; $(+ W2gf)$,

Interactions between van der Waals / London forces in the form of a van der Waals / London bond:

- 10 d) Dissolving of atoms/ molecules in a liquid by van der Waals / London bonds: $(+ W2Db)$
- 10 e) Absorption of atoms/molecules to solids van der Waals / London bonds: $(+ W2Ab)$

Ad D) 2 Basic (temperature) forces.

- 11) The force of light (photons) emitted by electrons: $(+ Q1f e)$,
- 12) The infrared force (photons) emitted by the atomic nucleus and protons: $(Qirf +p)$

For further explanation of the physical and chemical forces see **document F1d**.

APPENDIX 3a: CHEMICAL FORCES AND BONDS; THE CHEMICAL POSITIONS:

-1) Two types of real chemical forces/bonds:

Except the noble gases all other atoms / elements of the periodic table and their isotopes can form chemical covalent bonds in the form of common shared electron pairs. Based on the approximately 90 stable elements of the periodic table are just *two types* of real chemical bonds.

I) The chemical covalent bond (+ R1cb) of two simple radical 'shell' electrons;

II) The chemical covalent bond (+ L2cb) charge of one complete 'shell' electron-pairs

The author considers the physical-chemical charge binding (+ Lb) primarily as *physical binding* and being treated in **appendix 3b** at the physical forces and bindings.

Ad I) The chemical covalent radical force (+ R1ck) / radical bond (+ R1cb):

Atoms with an untethered 'shell' electron (= radical electron) are always on the lookout for a second electron to form together an electron pair. These two radicals form one covalent bond. The formation of such a radical and chemical bonding electron pair (+ R1cb) brings both electrons in an energetically lower and more favorable position relative to their atomic nuclei.

That is tangible and visible through the irreversible release of binding heat! That is the driving force behind this one-sided descending chemical radical reactions. Unbound electrons show thereby the chemical covalent radical force (+ R1cf).

In these molecules this *covalent bindings radically* is built up from two unpaired electrons with each atom or molecule either side the binding delivers itself one unpaired 'shell'-electron. Both atoms share that electron pair. That electron-pair is rather fixed.

Free radicals are chemically aggressive and can form all kinds of chemical radical bonds. Especially bonds in organic molecules are relatively weak and thereby (very) sensitive to radical reactions.

SCHEDULE 1: radical force and covalent bonds:

At the radical force / chemical covalent bonds can be distinguished:

- 1) an unpaired electron is present; the radical force is active: (+ R1ck),
- 2) an unpaired electron is absent; the radical force is absent: (-R1ck),
- 3) the covalent radically bond that is fixated (fi): (+ R1ficb),
- 4) the covalent radically bond that is flexible (fl): (+ R1flcb).

Comments:

- 1) The chemical covalent radical force is always active at the *outer side* of the atom or molecule. The covalent binding is radically operate only *inside* the molecule as an electron-pair.
- 2) A chemical covalent radical binding is flexible (fl) as soon as this reacts.
- 3) At the radical force and bindings are a total of 4 *chemical conditions* possible:
a) (R1ck+), (-R1ck) b) c) (+ R1ficb) and d) (+ R1flcb).

Characteristics of radical reactions:

- 1) On the reacting atoms or molecules *no physical changes* occur nor before, during or immediately after such radical reaction steps!
- 2) Two or more chemical radical reaction reactions can take place thereby directly after each other!
- 3) Covalent) chemical radical bindings (+ R1cb) exist in principle always from one single electron pair! This radical binding is fixated and are virtually not getting reactive by *biochemical reactions*. This does happens with strong acids or bases.
- 4) Radical reactions expired pretty random. Within the biochemistry of living matter this type of radical reactions cannot be controlled. Radical reactions and covalent bonds (+ R1cb) are radically unsuitable for the settlement of biochemical reactions in living matter with *three exceptions*:

Special chemical radical bindings:

a) Molecule bonds between C, O, N and S:

Two molecules consisting of the elements: C, O, N, S and H with an unbound electron don't form a rigid radical bond (R1ficb) but a much more flexible chemical charge binding (+ L2cb). The structure of the outer electron shells of C, O, N and S let shifting these radically covalent bonds between these atoms. In these molecules the fixated bound electron pairs are much more moveable than the normal real radical covalent bonds.

In that case this shift of electron pairs is always accompanied with physical changes on the atom / molecule. These radicals form radical fixed bindings (+ R1ficb) between the atoms C, O, N and S act as a more flexible *chemical covalent charge binding* (+ L2cb). See ad II).

b) The *proton reactions*: reactions with the loose H_3O^+ / H^+ :

The loose proton and alpha particle are the only 'atoms-cores' without nuclei electron shells. The alpha particle (He core), however, manifests itself as a (malicious) form of *radiation*. The loose proton (H^+ core) is an atomic nucleus *without* electron shells that normally doesn't manifests as radiation. In water that free H^+ directly transfers with the present gaseous H_2O into a H_3O^+ ion.

The 'proton' reactions relate to the attach or disconnect a proton (H^+) through which results in a charged molecule. These reactions are always accompanied by *physical changes* on the molecule as well. *Proton reactions* play an important role in the biochemistry of living matter.

c) The *half radical reactions*: reactions with one free electron (e^-):

These are biochemical reactions involving temporarily:

- one electron (e^-) is released via breakdown of an electron pair of a solved amphoteric metal, usually a metal ion (Zn, Fe, Co, etc.) or
- as a free electron.

That temporarily free electron (e^-) is also regarded as a *really radical* while the other electron of the atom / molecule electron pair on left behind. In water this atom/ molecule transforms into a positive particle or an even more positive charged particle / ion. In water, however, this results in the formation of *an ion* and not a *radical*. Overall this is a *half radical reaction*.

In water, these half radical reactions with connecting or disconnecting one electron (e^-) standard accompanied by *physical changes* on the atom/molecule. *Half radical reactions* play an important role in the biochemistry of living matter as well.

Ad II) The (bio)chemical covalent charge / binding (+ L2cb):

At the chemical covalent charge binding (+ L2cb) one of the atoms either side the binding prior to the binding showed an excess of electrons and thereby local a negative chemical charge force (+ L2cf-). The other atom of the binding showed a relative shortage of electrons and was thereby local positively charged (+ L2cf+). The atom with relatively too much electrons delivers *one electron-pair* now for making one chemical covalent charge bond (+ L2cb).

The atom with a deficiency of electrons uses this electron pair offered anything further jointly shared by both atoms either side the resulting *chemical covalent charge binding*. (+ L2cb).

Through the common parts of an electron pair or bring about both atoms of electron pairs a more ideal fill of both outer electron shells through a with high speed rotating tetrahedron with 4 electron-pairs. That ideal stuffing can be seen from the release of chemical binding heat. That release of binding heat is irreversible and is the driving force for settling this type of chemical reactions that are typical for biochemical reactions.

Such (*bio*)chemical covalent charge bonds (+ L2cb) in principle are only possible between the elements C, O, N, S and supplemented by the elements H and P. Only those elements can be connected through one, two or three common shared electron-pairs.

(Chemical bonds between the *element Si* and the elements C, O, N and S react primarily as *covalent radically bindings* and not as biochemical *covalent charge bindings*!)

The chemical covalent charge binding (+ L2cb) has different properties than the covalent radically bindings (+ R1cb). Between the atoms C, H, O, N, and S the electron pair of these covalent bonds can shift whereby a covalent chemical charge bond (+ L2cb) can be formed or this chemical bond can be broken.

In case these covalent charge bonds (+ L2cb) between C, H, O, N, S and P split into two radicals these two radicals are merged again which results in the original covalent chemical bond and not in a covalent radically bond!

The big difference, however, is that *real radical bindings* are *biochemical virtually completely inactive*.

General characteristics of chemical covalent charge bonds (+ L2cb):

- 1) The covalent bond (+ L2cb) is in fact only present and found between the elements C, H, O, N, S and (P).
- 2) By reactions with chemical charge bindings, such as biochemical reactions, you will never find two chemical reaction steps straight after each other. These chemical reaction steps are always separated by one and usually two intermediate physical steps with enzymes that go along with physical changes on the molecule!
- 3) For processing of biochemical reactions used by default:
 -) a *reaction medium*, which allows these physical changes on the molecules,
 -) water as reaction medium because of its most comprehensive dissolving properties for: 1) gases, 2) ions, 3) 'nopression' molecules. (nopression = molecules without characteristic of a gas and an electric charge)
 -) water also provides the proton (H^+) required for the settlement of proton reactions,
 -) amphoteric metals for the settlement of half radical reactions in which an electron (e^-) is involved,
 -) enzymes that serve as catalyst at the various biochemical reaction steps; that enzymes also ensure that the molecule gets or keeps the right spatial construction during and after the reaction.

All types of reactions in the biochemistry of living matter go together with the use of the 4 – 5 thousand now known enzymes. These reactions with enzymes allow chemical as well physical changes on the organic molecules. Because of the intervention of enzymes all reactions follow entirely predictable path whereby

Biochemical Pathways (BP) in fact acts as a *biochemical processor*.

These covalent charge bonds (+ L2cb) are only suitable for the settlement of biochemical reactions in living matter. In living matter nowhere biochemical reactions are structurally based on radical reactions.

SCHEDULE 2: CHEMICAL COVALENT CHARGE FORCE AND BONDS:

- 1) the chemical charge force is active: (+ L2ck),
- 2) the chemical charge force is absent: (-L2ck),
- 3) covalent charge bond is fixed: (+ L2ficb),
- 4) covalent charge bond is flexible: (+ L2flcb).

Comments:

- 1) The chemical covalent charge force is always working at the *outer side* of the atom or molecule. The covalent charge is only present *inside* the molecule.
- 2) The chemical covalent binding is flexible (fl) as soon as it can enter into a reaction.

At the chemical charge force and its bonds are in total 4 *chemical conditions* possible:

- a) (L2ck+), (-L2ck) b) c) (L2ficb) and d) (L2flcb)

The bonds are addressed in the **document D1**: forces, bonds and repulsions.

APPENDIX 3b: THE PHYSICAL FORCES AND BONDS; THE PHYSICAL STATES:

-1) The physical forces and bindings on the atom / molecule:

In document F1d and appendix 2 the author differentiates *on the atomic* four physical forces generated by the electron (1) and by the electron pairs (2) from the electron shells are excited because of the speeds of the atom in the universe.

SCHEDULES 1: THE PHYSICAL FORCES AND BONDS:

III) the van der Waals / London force and bond (+ W2f)/(+ W2b),

IV) the dissolving force and bond (+ W2Df)/(+ W2Db),

V) the absorption force and bond (+ W2Af)/(+ W2Ab) and

VI) the physically charge force and binding (+ Lf)/(Lb).

In fact the dissolving force (IV) and absorption force (V) are directly related to the van der Waals / London force. *In fact remain only two physically forces!*

Following the two chemical forces/bonds (Part 3a) now the physical forces and bindings are observed.

On the atom/molecule is any of the following four physical forces:

All atoms and molecules on earth are in a physical state as combinations of these four physical forces or their bindings:

Ad III) The van der Waals / London force and its bonds:

All electron pairs of atoms / molecules generate the van der Waals / London force in combination with speed in the universe. Normally only electron pairs in the outer electron shell of the atom / molecule can form van der Waals / London bonds.

SCHEDULE 2: THE VANDER WAALS / LONDON FORCE (W2f) AND ITS BOND (W2b):

1) the van der Waals / London force is active: (+W2f),

2) the van der Waals / London force is absent: (-W2f),

3) the van der Waals / London bonding that fixed bound is: (+W2fib),

4) the van der Waals / London binding that are flexible bound is: (+W2flb).

Explanation Schedule 2:

1) On earth virtually on almost all the atoms / molecules electron pairs are present and thus automatically the van der Waals / London force (+ W2f). The state of (-W2f) occurs only with the H atom and the H-radical. The H-atom, therefore, may not occur as a liquid or solid!

2) At the transition of ordinary matter to black hole atoms the present electron pairs inside the atom form van der Waals / London bonds. From the inside the electron-shells of common atom collapses towards the atom-core. During that collapse all the electron pairs breakup to loose electrons. That inside collapse of the electron shells of an atom is only possible if this atom possesses two or more electron pairs! (At the elements H, He, H₂ and Li that collapse of the electron shells cannot occur! These 3 lightest atoms / molecule are not accepted by the black hole and stay outside.)

3) In the case of a *fixed* van der Waals / London bond (+ W2ficb) this always results in a solid.

4) In the case of a *flexible* van der Waals / London bond (+ W2flcb) this results in a fluid.

5) If only the van der Waals / London force is active the atom / molecule in the state of a *gas* (+ W2gf).

At the van der Waals / London force and its bonds are in total 4 *physical positions* are possible:

a) (+ W2f), b) (-W2f), c) (+ W2fib) and d) (+ W2flb).

Ad IV) The dissolving force and binding:

Dissolving is only possible in liquids that arise via condensation of a gas. All atoms and molecules show a certain level of dissolving force. All atoms and molecules are to dissolve in liquids up to a certain level.

Dissolving happens by forming a dissolving bond (+ W2Db) between the dissolved atom / molecule and the fluid. In principle heat is released. Only the electron pairs in the outer electron shell of atoms and molecules can form such dissolving physically van der Waals / London bonds.

SCHEDULE 3: THE DISSOLVING FORCE AND BINDINGS:

- 1) the dissolving force is active: (+ W2Df),
- 2) the dissolving force is absent: (-W2Df)
- 3) the dissolving bond is fixed: (+W2Dfib),
- 4) the dissolving bond is flexible: (+W2Dflb).

Comments Schedule 3:

1) Charged particles are only soluble in water as ions.

2) In the case of a *fixed dissolving bond* (+ W2Dfib) the atom / molecule cannot dissolve as a gas in the liquid. In this case the atom / molecule is an ion or a nonpolar molecule.

3) In the case of a *flexible dissolving bond* (+ W2Dflb) is always a gaseous atom / molecule.

At the instant power and his bonds are in total 4 *physical positions* are possible:

a) (+ W2Dk), b) (-W2Dk), c) (+ W2fib) and d) (+ W2flDb).

Ad V) The absorption force and bonding:

All solids tend to absorb other atoms and molecules under formation of an absorption binding (+ W2Ab). All solids, atoms and molecules possess a absorption force related to the van der Waals / London force (+ W2Ak).

SCHEDULE 4: THE ABSORBING FORCE AND BINDINGS:

- 1) the absorption force is active: (+ W2Af),
- 2) the absorption force is absent: (-W2Af)
- 3) the absorption bonding is fixed: (+ W2Afib),
- 4) the absorption binding is flexible: (+ W2Aflb).

Explanation Schedule 4:

1) In the formation of an absorption bond heat is released. Only the electron pairs in the outer electron shell can realize these absorption bindings.

2) At a fixed (fi) absorption binding (+ W2fiAb) the atom / molecule at that time is not to remove from that solid.

3) At a flexible (fl) absorption binding (+ W2flAb) the atom / molecule is always to remove

At the absorption force and bindings in total 4 *physical positions* are possible:

a) (+ W2Af), b) (-W2Af), c) (+ W2Afib) and d) (+ W2Aflb).

Ad (VI) the charge force / bond and physical-chemical charge bond (+ L1b)

Only the noble gases naturally possess the ideal filling of the outer electron shell with one or with four electron pairs. As a result these noble gases are chemically inert. All atoms strive also to this energetically most favorable occupation of their outer electron shells with 8 electrons or 4 electron pairs together arranged in a tetrahedron rotating around the atomic nucleus.

For energetical reasons all atoms try to reach that ideal position as much as possible. These atoms / molecules becoming thereby positive or negatively charged and by that they generate a physical charge force (+ Lf).

Opposite charged atoms / molecules attract each other and form a *physical charge* binding. During the formation of charge binding in principle always binding heat is released. Only the outer electron shell of atoms can realize such charge bonds.

This charge binding occurs primarily between positively and negatively charged ions dissolved in water. (The COOH-binding is such a physical-chemical charge binding). Physical and physical-chemical charge bindings in principle always are un-dissociated bindings and salts dissolved in water.

SCHEDULE 5: THE CHARGE FORCE AND ITS BINDINGS:

- 1) the charge force is active: (+ L1f),
- 2) the charge power is absent: (-L1f)
- 3) the charge binding is fixed: (+ L1fib),
- 4) the charge binding is flexible: (+ L1flb).

Comments Schedule 5:

- 1) The physical charge force is always active at the *outer side* of the atom or molecule. The chemical covalent charge binding is only working at the *inside* of the ' molecule '.
- 2) A physical-chemical charge binding is *flexible (fl)* as soon as it decomposes into two ions. That reaction can only occur in the presence of water.
- 3) At a *fixed charge* binding (+ L1fib) the molecule is currently not separated into two ions.

At the physical-chemical charge strength and bindings are in total *4 chemical positions* possible:

- a) (+ Lk), b) (-Lk), c) (+ L1fib) and d) (+ L1flb)

-) Physical state and chemical status overall:

- 1) On the basis of these four physical forces and bindings are 64 physical combinations possible. See **document F1f**.
- 2) Some of these 64 combinations of physical forces and bindings cannot occur at the same time together on the atom/molecule. In advance, the author from that the atom/ molecule can occur in average up to 25 physical combination or physical states.

On the basis of the periodic table are about 1 – 2 million mono-molecules are to construct molecules each of which average 25 physically states can occupy. That results in a total collection of 25 – 50 million mono-molecules in all conceivable positions. This collection mono-molecules and physically positions is in principle finite and universe widely exactly the same!

APPENDIX 4: CHEMICAL BONDS OF MOLECULES:

-1) Between which atoms / elements which *chemical bonds* are possible:

On Earth all individual atoms and molecules can be in the position of:

1a) whether or not bound by a chemical covalent radical binding: (+/-R1cb),

1b) whether or not bound by a chemical covalent charge binding: (+/-L2cb),

1c) whether or not bound through a physical-chemical charge binding: (+/-Lb).

Ad 1 c): physical-chemical bond is a primarily a physically binding:

At dissolved un-dissociated salts one physical-chemical binding (+Lb) is present. This is actually not a true chemical bond. This is a purely *physical-chemical charge binding* (+L1b) as discussed in **appendix 3b**. From the outside and physically the un-dissociated 'molecule' is greater than it actually is.

Remain just two real chemical bonds:

SCHEDULE 1a: THE CHEMICAL RADICAL FORCE AND BINDING:

The following positions are to distinguish :

-) *force is not present (-R1cf),*

-) *force is present but untethered (+ R1cf),*

-) *flexible bond: (+ R1flcb),*

-) *fixed bond: (+ R1ficb),*

SCHEDULE 1b: THE CHEMICAL CHARGE FORCE AND BINDING:

The following positions are to distinguish :

-) *force is not present (-L2cf),*

-) *force is present but untethered (+ L2cf),*

-) *flexible bond: (+ L2flcb),*

-) *fixed bond: (+ L2ficb),*

-2) Digitized atoms:

The author has the elements of the periodic table broken down by 4 main groups. Of each group is a digital imaging created which, at a later stage, for each element / isomer can be refined by the specific information (the atomic number, the number of 'shell'-electrons outer electron shell, the number of 'core'-protons, the number of 'core'-electrons, the charge etc.)

SCHEDULE 2: CLASSIFICATION ELEMENTS PERIODICALLY SYSTEM IN MAIN GROUPS:

1) metals: (+ m +) *

2) amphoteric metals: (+ m -)

3) metalloids: (- m +)

4) halogens: (- m -)

*) Noble gases react chemically as a metal (+ m +)

-3) combinations of bindings:

With these four digital groups of elements are a total of ten different combinations of chemical bonds. Those ten combinations are in **Schedule 2** and **Schedule 3** are spelled out.

SCHEDULE 3: OVERVIEW COMBINATIONS OF CHEMICAL BONDS:

At the bases of schedule 1 now 10 chemical combinations are possible:

- 1) metal (+ m +) ↔ metal (+ m +),
- 2) metal (+ m +) ↔ amphoteric metal (+ m -),
- 3) metal (+ m +) ↔ metalloide (- m +),
- 4) metal (+ m +) ↔ halogen (- m -),
- 5) metal (+ m +), an amphoteric species (+ m -) ↔ metal chemistry, an amphoteric species (+ m),
- 6) metal chemistry, an amphoteric species (+ m -) ↔ metalloid (- m +),
- 7) metal chemistry, an amphoteric species (+ m -) ↔ halogen (- m -),
- 8) metalloide (-m +) ↔ metalloide (- m +),
- 9) metalloide (-m +) ↔ halogen (- m -),
- 10) halogen (-m-) ↔ halogens (- m -).

-4) Which chemical or physical-chemical bonds are if at all possible:

In **Schedule 3** below, the author has tried all combinations of chemical bonds that may or may not occur between the digital-made main groups of elements of the periodic table.

SCHEDULE 4: CHEMICAL BONDS BETWEEN MAIN GROUPS OF ELEMENTS:

Ad 1) Direct binding between a real metal (+ m +) – real metal (+ m +):

Not possible as chemical bonds:

- =) the covalent charge bond; (-L2cb),
- =) the covalent radical bond; (-R1cb),
- =) the half-radical bond (-R1cb); separation of an electron (e-) is not possible,
- =) the chemical proton binding (-L2cb) is not possible,
- =) the chemical charge binding c. q a un-dissociated dissolved salt; (-L1b +/-),
- =) the physical charge binding c. q a salt; (-L1b +/-).

With pure metals (+ m +) are *no chemical* covalent force / bonds are possible. Metals lack the possibility of a driving force for living matter.

Possible but only on the individual metal atom:

- =) the half-radical bond (+ R1cb), temporarily splitting off of an electron (e-) from an electron pair in orbit around the atomic nucleus.

Ad 2) Direct binding between a really metal (+ m +)-metal chemistry, an amphoteric species (+ m-):

Not possible as chemical bonds:

- =) the covalent charge bond; (-L2cb),
- =) the covalent radical bond; (-R1cb),
- =) the half radical bond (-R1cb); the separation of an electron (e-) is not possible,
- =) the proton binding (-L2cb); the split-off of a proton is not possible,
- =) the chemical charge binding c. q a un-dissociated dissolved salt; (-L1b +/-).
- =) the physical charge binding c. q a salt; (-L1b +/-).

Possible but only on the individual real metal and metal atomic chemistry, an amphoteric species:

- =) the half radical bond (+ R1cb), temporarily splitting off of an electron (e-) from an electron pair in orbit around the atomic nucleus,

With pure metals and pure amphoteric metals are neither chemical covalent charge bonds to form. On the basis of metals and amphoteric metals no driving force for living matter is to generate.

Ad 3) Direct binding between a really metal (+ m +) – metalloid (-m +):

Not possible as chemical bonds:

- =) the chemical covalent bonds: radical (-R1cb),
- =) the half radical bond (-R1cb); the separation of an electron (e-) is not possible,
- =) the proton binding (-L2cb); the binding / fork of a proton is not possible.

Possible to chemical bonds:

Metals can direct bindings with metalloids forms:

- =) the chemical covalent charge bonds (+ L2cb); (only Me-carbides, oxides and sulfides),
- =) the chemical charge bonds in the form of dissolved un-dissociated salt; (+ L1b +/-),
- =) the physical charge binding c.q. a salt; (+ L1b +/-).

Based on carbides, Me-Me-oxides and sulfides to generate itself is not a driving force as the driving force behind the (bio) chemistry of living matter. On the basis of these bindings is no driving force.

Ad 4) Direct binding between a really metal (+ m +) – halogen (-m-):

Not possible to chemical bonds:

- =) the chemical covalent charge bond; (-L2cb),
- =) the chemical radical bond; (-R1cb),
- =) the half radical bond (-R1cb); the split-off an electron is not possible,
- =) the proton binding (-L2cb); the split-off of a proton is not possible.

Possible to chemical bonds:

- =) the chemical charge binding and only if un-dissociated dissolved salt; (+ L1fib),
- =) the physical charge binding in the form of a salt; (+ L1fib).

Real metal with the halogens can only form physical and chemical/chemical charge bindings (+ L1b) but no covalent charge bonds (-L2cb). On the basis of metal halogen salts is no driving force for living matter is to generate.

Ad 5) Direct binding between a metal (+ m +), an amphoteric species (+ m)-metal chemistry, an amphoteric species (+ m-):

Not possible to chemical bonds:

- =) charge the covalent bond; (-L2cb),
- =) the covalent radical bond; (-R1cb),
- =) the half radical bond (-R1cb); the separation of an electron (e-) is not possible,
- =) the proton binding (-L2cb); the split-off of a proton is not possible,
- =) the chemical charge binding c.q. an un-dissociated dissolved salt; (-L1fib),
- =) the physical charge binding c q a salt; (-L1fib).

Possible but only on the individual chemistry, an amphoteric species real metal atom:

- =) the half radical bond (+ R1cb), temporarily splitting off of an electron (e-) from an electron pair in orbit around the atomic nucleus.

With pure amphoteric metals no chemical covalent bonding force / charge are possible. Metals ↔ amphoteric metal lacks the possibility to generate a driving force for living matter.

6) Direct binding between a metal chemistry, an amphoteric species (+ m) – metalloid (-m +):

Not possible to chemical bonds:

- =) the chemical covalent bindings radically; (-R1cb),
- =) the half radical bond (-R1cb); the separation of an electron (e-) is not possible,
- =) the half radical bond (-L2cb); the binding/fork of a proton is not possible.

Possible to chemical bonds:

- = charge) the chemical covalent bonds (+ L2cb); (only Me-carbides, oxides and sulfides),
- = charge) the chemical bonds in the form of dissolved salt: un-dissociated (+ L1b),
- =) the physical charge binding c. q a salt; (+ L1b).

On the basis of amphoteric Me-Me-Me-carbides, oxides and sulfides in itself is not a driving force as the driving force behind the chemistry of living matter.

7) Direct bond between metal chemistry, an amphoteric species (+ m)-halogen (-m-):

Not possible to chemical bonds:

- = charge) the chemical covalent bond; (-L2cb),
- =) chemical radical bond; (-R1cb),
- =) the half radical bond (-R1cb); the separation of an electron is not possible
- =) the proton binding (-L2cb); the binding/fork of a proton is not possible.

Possible to chemical bonds:

- =) the chemical charge binding and only as un-dissociated dissolved salt; (+ L1b),
 - =) the physical charge binding in the form of a salt; (+ L1b),
- Amphoteric metals can with the halogens only physical and chemical charge bindings (+ L1b) forms. This consisting of a positively charged metal (ion) and a negatively charged halogen (ion). A physical (incomplete) charge binding in the form of salts and a chemical (full) un-dissociated charge binding in the form of a dissolved salt. On the basis of metal halogen salts chemistry, an amphoteric species is not a driving force.

8) Direct binding metalloide (-m +)-metalloide (-m +):

Not possible to chemical bonds:

- =) Not possible.

Possible to chemical bonds/comments:

- =) chemical covalent bonds; (+ L2cb),
- =) covalent bindings radically; (+ R1cb),
- =) half radical bond (+ R1cb); some Metalloids (e.g. O) can free up an electron,
- =) proton binding (+ L2cb); from H₂O, OH, SH, NH₂ and COOH-binding is proton,
- =) chemical charge binding (+ L1b); a un-dissociated dissolved salt/COOH,
- =) physical charge binding (+ L1b); the salt/connection COOH; H₃O⁺ and NH₄⁺ are the only cations,
- =) (+ Db) in liquids of molecules from C, H, O, N and especially in water. *)

9) Direct bond between metalloid (-m +)-halogen (-m-):

Not possible to chemical bond:

- = charge) the chemical covalent bonds; (-L2cb),
- =) the half radical bond (-R1cb); the separation of an electron is not possible,
- =) the proton binding (-L2cb); the split-off of a proton is not possible.

Possible to chemical bond:

- =) the chemical covalent radical bond; (+ R1cb),
- =) the chemical charge binding (+ L1b) c. q a dissolved salt, ongedissocieerd
- =) the physical charge binding c. q a salt; (+ L1b); only in combination with ammonium halogen. **)

10) Direct binding halogeen (-m-)-halogeen (-m-):

Not possible to chemical bond:

- = the chemical covalent charge bond; (-L2cb),
- =) the half radical bond (-R1cb); the division of one electron is not possible,
- =) the proton binding (-L2cb); the division of one proton is not possible,
- =) the chemical charge binding c.q. an un-dissociated dissolved salt; (-L1b +/-),
- =) the physical charge bond; a halogen is not listed as a cation (-Lk +).

Possible to chemical bond:

- =) the chemical covalent bond (+ R1cb), radical (F₂, Cl₂) with only one binding per atom
- Via the halogens is not a driving force for living matter.

***) Notes Schedule 4 in respect of item 8):**

- 1) H can react to charge directly with all other metalloids covalent bonds. Because of its small size it is H-atom very suitable as 'filling'-atom in organic molecules. This also has a large H-bond energy content.

- 2) The C-H, N-H and P-H bond and particularly the C-H and P-H bond contains a high binding energy which is also biochemical irreversible turn into CO₂, H₂O, NO / NO₂ / NO₃-which binding heat is released.
- 3) The O-H bond, by contrast, has the lowest possible energy content of all chemical covalent charge bonds.
- 4) The metalloids C, N, O and S 2-4 per atom can be interconnected multiple covalent charge bonds with other metalloids but only single bonds with metals, amphoteric metals and halogens.
- 5) Only on the basis of C in combination with H, O, N and S is a huge number of molecules construct. That makes the metalloids C, H, O, N and S chemical seen as only ones suitable as basic building block of the central general biochemistry of living matter.
- 6) The oxidation of the covalent charge bonds between H, C and N or H₂O to, CO, CO₂, NO, NO₂ provides a lot of energy / heat and thus driving force on. Due to the large energy gains such chemical conversions already at relatively low temperatures possible.
- 7) P can also enter into 2-4 bindings but in fact only with the elements The elements P and O and S. S are so less commonly usable and unsuitable for the supply of heat. P and S are usable only in specific places.
- 8) Si is a chemically, also more or less a metalloid. Molecular bindings with Si and other metalloids manifest themselves always as solids or dissolved as 'nopression' molecule or ion but never as dissolved gas, in contrast to C. In chemistry, an amphoteric species on a more physical way seems Si metal than on a metalloid.

Only with molecules on built from metalloid elements C, H, O, N, S and P, via the conversion of binding energy into heat, to generate the appropriate driving force for living matter. Molecules made up of these elements can virtually all types of comments.

These elements are the only elements of the periodic table which may lie to the biochemistry of living matter.

****) Notes Schedule 3 in respect of item 9):**

- 1) The metalloid-halogen bonds turn out only to be able to be made through radicals and radical under formation covalent bonds. The following positions are to distinguish :
- 2) The metalloid's with halogens results in only one binding at the same time. Because of that one single bond in the form of an electron pair are halogenated-metalloid bonds with C, N, P very hard to get in the position of a covalent binding and thus in a biochemical reactive position. In practice metalloid ↔ halogen bonds are biochemical (very) difficult degradable.
- 3) The covalent binding between metalloid ↔ halogen (C-Cl, C-F etc.) contain a low energy-content. Biochemically these halogenated bonds are difficult to react. Strong acids or bases are needed.
- 4) With O and S halogens can form not more than one binding. Formation of more complex molecules around a central halogen atom is not possible. Halogens are therefore completely unusable for integration as a basic building block for living matter and thus toxic.

APPENDIX 5: See document F1f:

**MINIMUM / MAXIMUM 1 PRINCIPLE OF PHYSICAL / CHEMICAL FORCES
AND THEIR BINDINGS.**

APPENDIX 6: See document F1f

MINIMUM / MAXIMUM 1 PRINCIPLE OF CHANGES in those physical / chemical forces and
their bindings.

APPENDIX 7: PHYSICAL AND CHEMICAL REACTION MODELS WITHIN THE MIN / MAX 1 PRINCIPLE.

-1) The possible physically and chemically reaction models:

In **document F1f** are explained

- a) the min/ max 1 principle of the state of atoms/ molecules at any moment and
- b) the min/ max 1 principle of changes in that physical or chemical state.

These min/ max 1 principle results in the following physical and chemical reaction models:

-a) The 1 - 1 reactions: All changes on an atom / molecule *not accompanied* by a change in the present physical or chemical set of forces and bonds.

At 1 - 1 reactions can only change in *quantitative* terms. It concerns physical processes such as the (increase)/decrease in temperature, pressure, concentration, speed, potential and kinetic energy etc.

-b) The 2 - 1 reactions: All physical or chemical association steps with two particles in the form of atoms or molecules.

These reactions / changes include merging one particle into two particles. By definition each reaction step is accompanied by *one change* in the system of physical or chemical forces and / or bonds. This reaction type occurs at all:

-) all physical processes such as phase transitions; such as condensation, evaporation, solidification, melt,
-) all physical-chemical dissociation reactions,
-) all chemical reactions and biochemical reactions,

In nuclear physics and particle physics such 2 – 1 reactions also occur at colliding in particle accelerators where after the clashes smaller particles (quarks, strings, neutrino's and photons) are formed. These collisions change the mass, the electric charge and the magnetic spin in qualitative terms. See **document F1a 2014**.

-c) The 1 - 2 reactions: All dissociations tapping with one molecule / cluster of atoms through the breakup of a physical binding or of a chemical bond disintegrates to two atoms / molecules

These changes include the splitting of one particle in two particles. That is, by definition, also accompanied by a change in the system of physical or chemical forces and bindings and thus with one change in the physical or chemical characteristics on the particles released during a reaction.

Such 1 – 2 reactions are found in all:

-) physical processes such as the phase transitions,
-) physical-chemical dissociation reactions,
-) chemical reactions and biochemical reactions,

In nuclear physics and particle physics are such 1 - 2 reactions also found in which atoms, atomic nuclei and elementary particles fall apart into two smaller particles.

-d) The 2 - 2 reactions; All physical, chemical, nuclear or elementary particle reactions involving in a single reaction step two atoms / molecules / particles elementary physically or chemically react with one another and during in one reaction step directly two other atoms / molecules / elementary particles.

Such 2 – 2 reactions *seem* widely to occur. However upon further analysis of such chemical, physical, and nuclear reactions show that such 2 – 2 reactions not consist of a single reaction step!

These 2 – 2 reactions always consists of two following steps consisting of a series of 2 - 1 and 1 - 2 reactions. *Not exactly at the same moment, but just right after each other.* These 2 - 2 reactions are technically impossible. In one step. *The min / max 1 principle forbids 2 – 2 reactions!* See **document F1f**.

On large molecules like proteins theoretically exactly at the same time, and independently of each other, two reactions can occur. But only if such reactions take place at a distance of more than 2 mono-molecules of each other. In this case, these two reactions affect each other also not mutual.

Then there are no 2 - 2 reaction but *two separate 2-1 and 1-2 reactions* that are separate and by chance exactly at the same time on one macromolecule. On macro-molecules can therefore take place at the same time that two changes exactly each and thereby each to the min / max 1 principle.

In particle accelerators the changes happens so fast that it *seems* that the reactions do not follow a series of successive 1 - 2 and / or 2 - 1 reactions. According to the author at the level of nuclear fission, nuclear fusion and particle physics also all the changes strictly contained to only 1 - 2 and 2 - 1 reaction steps!

-2) Remain only 3 reaction models about:

Author differentiates in the chemistry, physics, nuclear physics and particle physics only three types of physical and chemical changes and associated response models:

-) 1 - 1 reactions:

Forces and change bindings exclusively in *quantitative* terms,

-) 1 - 2 reactions:

With this type of chemical reactions and physical changes is one physical or chemical bond broken and physically or chemically a molecule falls apart into two particles being atoms / molecules / particles. At the breakup of the binding the forces are visible again.

A change occurs in the system of physical or chemical forces and their bindings.

-) 2 - 1 reactions:

With this type of chemical reactions and physical changes are two atoms / molecules any physical or chemical binding to which the relevant physical or chemical forces disappear and these forces merge into one binding. Correspondingly a change in the system of physical or chemical forces and their bindings.

APPENDIX 8: BASIC STRUCTURE BIOCHEMISTRY OF LIVING MATTER WITH ENZYMES:

-1) the role of enzymes and catalysts:

Organic molecules contain a number of covalent bonds in terms of energy content charge more or less similar and energetic seen more or less at the same time (bio) chemical reaction would.

In biochemical reactions would be such a random order lead to the same disorder as in the case of radical reactions. At the random settlement of such reactions would all kinds of no more biodegradable intermediates. In living cells that would be disastrous.

With their spatial structure provide enzymes / coenzymes sure the molecule step by step (in accordance with the min/max 1 principle) exactly in the right order is broken down or a molecule is built up. For that purpose each chemical step is accompanied by its own specific enzyme.

-2) Enzyme ensures that only the correct binding responds:

By the physical adhesion of the enzyme to the reacting molecule (+ W2Ab) via adsorption or through charge (+ Lb) are both first soluble mono-molecules (+ W2Db) together just too large to still really solved (+ W2fiDb) to stay. The adhesion of the enzyme to the mono-molecule brings both molecules temporally in an unresolved position (-W2fiDb).

By the adhesion of the enzyme only the conscious desired place on the mono-molecule chemically becomes active while the enzyme at the same time, blocking all other bindings on the molecule for a chemical reaction. All other bindings are chemically blocked. As a result, only the appropriate chemical reaction step in the chain occurs.

-3) Enzyme also ensures that the molecule retains the right spatial structure:

In addition, the enzyme sure the molecule after the chemical reaction step the right spatial structure or reserves. The enzyme thus in all respects only the desired reaction take place and no other reaction step.

The enzyme can only attach to mono-molecules with the right stereo-isomer and right spatial structure. In that respect are all enzymes are stereo-isomer specifically targeted. Only one binding (the good one) is now reactive. When the chemical reaction step have occurred the binding with the enzyme is disconnected. Both mono-molecule are dissolved position (+ W2Db). Now the next chemical reaction step follows. Every chemical reaction step biochemical reactions makes use of its own specific enzyme that is essential for each bio-chemical step.

This applies in principle for all the various chemical reaction steps in living matter in both BP and BP as whole system of biochemical reactions in all other conceivable theoretically possible (bio-) chemical systems. The complex of several thousand enzymes / coenzymes ensures that all (bio-) chemical reactions in living matter occur step by step in the right order and spatial structure and thereby in a completely predictable way. The conversion of covalent binding energy in heat / infrared photons is the driving force behind all biochemical reaction steps.

The covalent charge bond (+ L2cb) is the *any chemical bond* both required properties of a) a driving force and b) full control of the reaction via enzymes. However under more extreme conditions (e.g. UV light, cosmic rays) such covalent charge bonds are to split up into two radicals. All radical reactions remain thereby a threat to the biochemical system in living matter.

4) Basic structure enzyme regulated reactions:

Take a *random* molecule **M** from the diagrams of Biochemical Pathways BP or BP e. d that some chemical steps which undergoes the molecules **M1, M2, M3, M4, M5** are formed. For the settlement of each chemical reaction step is a specific enzyme needed: **E1, E2, E3, E4, E5** etc.,

The physical variables in terms of strength and bonding are: the charge force: (+/-Lk), the gas force (+/-W2gk), the dissolution force (+/-W2Dk) and the adsorption force (+/-W2Ak).

In biochemical chains are the following molds:

A) Adhesion molecule M1 to the specific to that reaction step suitable enzyme E1:

A1) The adhesion of molecule M1 to enzyme E1 through electrical charge and the formation of a temporary charge binding (+ Lb):

M1 : (+ Lk/-Lb), (+ W2Ak/-W2Ab), (-W2Dk/+ W2Db), (-W2gk) (= molecule dissolved and not absorbed) +
E1 : (+ Lk/-Lb), (+ W2Ak/-W2Ab), (-W2Dk/+ W2Db) (-W2gk) (= molecule dissolved and not absorbed) →

M1E1 : (-Lk/+ Lb), (+ W2Ak/-W2Ab), (+ W2Dk/-W2Db) (-W2gk) (= molecule is not solved!)

A2) In case of adhesion via adsorption and formation of an temporary absorption binding (+ Ab):

M1 : (-Lk/-Lb) (+ W2Ak/-W2Ab) (-W2Dk/+ W2Db) (-W2gk) (= solved) +
E1 : (-Lk/-Lb), (+ W2Ak/-W2Ab), (-W2Dk/+ W2Db) (-W2gk) (= solved) →

M1E1 : (-Lk/-Lb), (-W2Ak/+ W2Ab), (+ W2Dk/-W2Db) (-W2gk) (= absorbed)

In both cases the conglomerates of 2 molecules get in the form of **M1E1** in an undissolved position (-W2Dk/+Db). In both cases the chemical reaction takes place as the molecule M1 M1E1 itself as very temporarily in an *undissolved position*.

B) Because enzyme E1 only one charged and reactive position at the molecule is available for a chemically reaction:

To the response to the covalent charge force to take place, the **molecule M1** partial charged by hitting an internal shift of one of the present electron pairs:

Ad 1): **M1E1**: → (+ Lk/+ Lb), (+ W2Ak/-W2Ab), (+ W2Dk/-W2Db) (-W2gk)

Ad 2): **M1E1**: → (+ Lk/-Lb), (-W2Ak/+ W2Ab), (+ W2Dk/(-W2Db) (-W2gk)

The actual chemical reaction takes place and that results in molecule **M2E1** that likewise is insoluble in water. At the reaction creates a second particle in the form of a molecule, an electron / proton or a small gaseous molecule. For those particles applies the stringent requirement that both must be *soluble* in water.

C) The detachment:

Next, there is the place where decoupling **M2E1** decomposes into molecule **M2** and the enzyme **E1**. **M2 molecule** must be soluble in water.

Normally the enzyme **E1** unchanged from the reaction step. If on the **E1 enzyme**, however, a change have occurred than are coenzymes needed on the enzyme to generate back to its original state **E1**.

D) Follow-up:

Molecule **M2** then attach to it the specific for the next reaction step suitable enzyme **E2**. Then the cycle A, B and C repeats again.

APPENDIX 9: BILLIONS OF EARTH LIKE PLANETS IN UNIVERSE:

-1) The periodic table was realized approximately 20-25 billion year ago during the Big Bangs. Every galaxy started with its own Big Bang and through nuclear fusion of hydrogen:

All 4 – 20 billion galaxies started some 20 – 25 billion year ago at the same moment with their own hydrogen supernova / Big Bang. These Big Bangs are explained in **phase 16** of the universe cycle (**G7 + figures 42 – 54 G8**). During the nuclear fusion reactions of hydrogen for energetically reasons only elements of the *periodic table* can be formed. See **document F1d**.

In the center of these Big Bang the 'electron'-shells of the newly formed higher collapse towards their atomic nucleus. These ordinary atoms were transformed into black hole atoms. At the moment of these Big Bangs the central black hole of that future galaxy (**R1 A**) was formed. See **figures 42 – 54 G8**.

The neutrino's and light (photons) of these hydrogen supernovae have passed the Earth already long ago. Within a period of 14 – 18 billion years all neutrino's and photons of light and infrared are regenerated to electrons / protons and finally into hydrogen. On Earth these Big Bangs and start of galaxies are no longer perceptible. During that hydrogen supernova's is about 13% of the combined hydrogen was transformed into the central black hole of the galaxy. About 2% to higher fused atoms are ejected by the explosion ejected together with approximately 85% of the originally not fused hydrogen. (That fusion of hydrogen will happen later in stars!)

-2) Formation of stars via condensation of H₂:

Cooling of the expanding hydrogen also plasma containing higher elements and their molecules results in condensation of all plasmas to gases. At further cooling occurs condensation of gases into liquids and solids. That results in local pressure differences and the emergence of small areas within that of the sub-rotation areas **R1 A**.

Further cooling also eventually leads to condensation of gaseous H₂ and to the accumulation of liquid H₂ in the center of all the meanwhile resulting rotation areas. Within *each super nova* area (pre-galaxy) approximately 100 – 200 billion smaller sub-rotation areas develop in the emitted H₂ gas around big planet-like objects that approximately 95 – 98% of all solid matter of the future solar systems.

As a result of the still ongoing deceleration of the expansion of the universe occur at least 4-5 different forms of rotation / angular speed both within the galaxies as between the future galaxies themselves.

After cooling of these gases and eventually for the second time condensing of the H₂ gas about 10 – 15 billion years after the Big Bang and around all the central black holes of the galaxies approximately 100 – 200 billion stars together with 1 – 10 planets develop. **Kuiper belts** and **Oort clouds** are more or less standard to expect. A number of cases results in binary stars.

At all galaxies occur the formation of new hydrogen out of neutrinos and photons and thus the formation of new stars.

Under the influence of gravitation is presumably already the largest part (about 95-98%) of the emitted at the supernova debris already concentrated in the *core* of this hydrogen spheres / pre-stars. A relatively small proportion (around 2 - 5%) of that supernova debris is present in the periphery of the star and accumulates through gravity resulting in 1 – 4 small solid planets and 3 – 7 larger mostly *gaseous* planets in orbits around the star. The orbits of these planets by gravitational getting situated in a more or less flat plane rotation around the star.

-3) Near all the old and new stars are to expect one or more planets:

As a result of the condensation process described above in conjunction with the gravitation around almost all the stars in the universe there will a cord of 1 – 10 planets and accompanied by no, one and even several moons. Everywhere broadly the same situation as in our solar system.

Thus, history of star indicates that the vast majority of stars in the universe a cord with all types of planets and their moons to be expected including the presence of accompanying **Kuiper belts** and **Oort clouds**.

The author expected in the universe about 3 – 5 times more planets to than stars. See **phase 16 – 22** of the universe cycle in **G7, G8 and Figures above 54**.

-4) The conditions for planets with 'living matter' can be derived:

In case of a cord with multiple planets relatively quite close to the star one or more small planets with water at the surface can be expected and thus the development of living matter. Universe-widely these 'live-suitable' planets have to meet the following requirements:

4.1) Gravitation and the atmosphere:

The planet must contain enough matter as roughly planet Earth. The planet should generate enough gravitation to hold an atmosphere. Planets the size of Earth and gravitation can generate an atmosphere with a vapor pressure up to dozens of bar. Because of the greenhouse effect such planets are completely unsuitable for the development of a biochemical system with 'living matter'. At most small planets the size of Earth to the high atmospheric pressure and connecting CO₂ and CH₄ concentrations are the limiting factor for the development of living matter!

The development of living matter however is only possible if the air pressure at the surface of the planet is just between 0.5 – 1.2 bar and not more. This requirement originates the biochemistry of 'living matter'. The 'air pressure' on the surface of the planet allows fairly tight requirements. (The content of CO₂ and CH₄ is decisive for the greenhouse effect.

This extremely low pressure of 0.8 – 1.2 bar is only to achieve in case in the final phase of the construction a huge collision of the planets occurs between two 'half' earth like planets. Than most of the existing atmosphere is emitted into the solar system. The remaining 'air pressure' for the most part has to be made up of the *inert* N₂. Because of greenhouse effects the atmosphere should have very extremely low concentrations of CO₂ and CH₄. The total *gas pressure* to the surface of the planet to biochemical reasons should preferably not to be lower than approximately 0.8 bar and, on the other hand, preferably not above approximately 1.2 bar.

The size of the planet and thus its gravitational order size should be the same as that of the Earth. Such a planet follows the same genesis as the Earth. Because the required low pressure in the atmosphere *only extremely few* minor 'Earthlike' planets in the universe are really suitable for the development of living matter.

4.2) Distance to the star and 'life zone':

The orbit of 'life suitable' planet around the star must stay continuous within the so-called 'life zone' of the star; not too close to the star nor too far away. Too close to the star results in too much irradiation of light / heat. That flows into a planet warmed up too far. Is the orbit situated too far away from the star this results in a too cold planet in which all or most of the available water is converted in ice. For every star in the universe is to define such a 'life zone'.

The actual temperature of the planet's atmosphere, however, is also determined by the degree of the greenhouse effect and thus by amount of greenhouse gases CO₂ and CH₄ in the atmosphere.

On real life favorable planets, the temperature distribution on the planet such that a significant portion (about 10 – 20%) of the water present is permanently fixed as ice on the polar ice caps and that an important part of the carbon is captured via minerals (CaCO₃), ion (bicarbonate) and / or plant material in the form of peat, coal, petroleum and natural gas.

The 'life zone' for the planets with the potential for the development of living matter is in a fairly large shell area with inner radius of at least 100 million km and an outer radius around the star of up to about 200 – 300 million km. For every star such 'life zone' is to estimate.

4.3) The temperature surface of the star:

Because photosynthesis on the planet the surface temperature of the star should have the same surface temperature like the sun with its optimum emission of visible light and possibilities for photosynthesis on the planet as the driving force for the development of living matter.

4.4) Magnetic field:

As a result of the nuclear fusion process all stars emit a high energy radiation like neutrinos, gamma-radiation, UV light and high-energy particles of matter. On the planets that radiation generate all kinds of radical reactions. These are harmful to the biochemistry of any 'living matter' on the planet.

The intensity of this harmful radiation and cosmic radiation is reduced considerably in case both the planet and the star have a rotating center consisting of liquid iron / manganese. In that case, both the star and the planet are surrounded by a magnetic field which distracts an important part of this harmful cosmic particles toward the poles of the star as well the planet where the particles are trapped.

All 'live suitable' planets need a rotating *liquid* iron / manganese core. That is only possible if *nuclear fission reactions* take place in and around the core of the planet. Lacking such a liquid core and magnetic field then the relevant planet in fact continuous exposure to high doses of cosmic radiation which is harmful to all forms of living matter on the planet and its development.

4.5) Day length:

Because of the rotation of the core of the planet also rotates the planet as a whole around its own axle. For 'viable' planets, this rotation speed should be between about 12 and 36 hours.

Furthermore, the axis of rotation of the planet to have a certain angle of approximately 30 degrees to the plane of the planet around the star. That provides good energy distribution across the planet and over the year through seasons.

4.6) The necessity of dry land:

In case the conscious planet completely covered with water all dissolved molecules constantly move. In the absence of land or the presence of too little dry land nowhere on the planet over a long period of approximately 100 million years to build a high enough concentration for the development and formation of: 1) ATP for the photosynthesis, 2) the basic biochemistry of living matter (see Biochemical Pathways), 3) the cell wall and 4) the RNA / DNA as well as the arrangement thereof in genes and chromosomes.

For the development of living matter on the planet a large contiguous dry land area (minimum 20%) to be present such as in prehistoric times on the Earth. That dry (desert like) continent is a prerequisite for the steady development of the biochemistry of living matter. Life cannot develop around the so called 'smoothers'. Living matter can neither develop as the surface of the planet (> 80%) whole or far-reaching is covered with land. The planet than has too little water.

On 'creating a viable ' planets should the surface to water and amount of water not too small because then both the temperature at the surface of the planet as the salt concentration in the 'sea water' too high. The surface of the water must not be too big because then development of living matter is no longer possible.

On the planet, the oceans for the emergence of air pressure differences and for spreading warmth over the planet and for the transport of water via precipitation to country. For planets with development of living matter present a necessary water-cover author keeps to anywhere between about 20 – 80% in combination with a water shell of average 2 – 4 km thick so that the salt concentration in the seawater doesn't becomes too high.

4.7) Volcanism:

Both volcanism as tectonics with floating plates country is important for the recycling of matter on the planet and for creating concentration points on land to the development of living matter. That is only possible if the core of the planet is in a molten state.

4.8) Global requirements for suitable planets ' for ' living matter:

Living matter can develop on any other rotating, planet in the universe compatible with the Earth:

-) all atoms of the periodic table and especially the elements C, H, N, S and P has to be < 1% of the whole;
O < 10 - 15%,
-) sufficient liquid water with a water covering between 20 – 80% with an average depth of at least 0.5 – 4 km; also about 1% of the whole mass of the planet,
-) an atmosphere consisting mainly of N₂ with a total air pressure between ca. 0.5 < bar < 1.2,
-) free oxygen provides for the formation of O₃ which is able to eliminate harmful UV-radiation,
-) a rotary iron/manganese core; in that case the planet is surrounded by a magnetic field,
-) a period around the own axle between 12 – 36 hours,
-) an almost circular orbit around the star,
-) an angle of about 30 degrees with the rotation plane around the star.

In that case sufficient water is available for cloud formation and lightning discharges. Via radical reactions the formation of which about 1 – 2 million molecules is expected while cosmic radiation is reduced sufficiently. Planet Earth possesses an extremely favorable amount of water, air pressure, a magnetic field, and sufficient O₂ and O₃. Planet Earth in all respects is an extremely ideal and at a more or less constant distance to the Sun with relatively few greenhouse gases (CO₂ and CH₄) in the atmosphere.

-5) 'Earth like' planets are extremely rare per galaxy; the universe however contains many billions of ' earth like' planets:

According to astrophysicists the universe contains approximately 4 – 20 billion galaxies. Each Galaxy in itself contains some of ca. 100 – 200 billion stars. In total in the universe about 4 – 40 x 10²⁰ stars are present and at least as many planets. The author expects a number of about 10¹⁹ planets in the 'life zones' of stars with the *potential* to formation all around 1 - 2 million mono-molecules.

Only very few of these 10¹⁹ planets have the potential for the formation of living matter. See **Appendix 10**. In all cases the biochemistry of all that life in the universe at exactly the same biochemical principles such as that are found in living matter on Earth. See **Appendix 13**.

APPENDIX 10: ESTIMATE OF THE NUMBER OF 'EARTHLIKE' PLANETS WITH LIVING MATTER IN THE UNIVERSE:

-1) Huge number of stars and planets:

The number of galaxies amounts to according about 4 – 20 billion. Each galaxy contains approximately 100 – 200 billion stars. Every star is surrounded by 1 – 10 planets. Every star has its own zone with planets where living matter is possible. That means about 10^{21} planets in orbits around stars.

a) One out ten stars has the wright surface temperature for photosynthesis on the planet :

Now 10^{20} planets remain.

b) Only one of ten planets is in the 'life-zone' of the remaining stars.

The author now expects about 10^{19} planets in the universe that are in the 'life zones' of their star. That is still an incredible large number!

Despite their favorable position in relation to their star, not all 10^{19} planets suitable for the development of living matter. The planet must also to five mitigating conditions regards: a) a relatively low air pressure, b) the land / water distribution sufficiently large, c) the presence of magnetism d) of volcanism and tectonics!

-2) Number of planets in the universe according to the Earth:

Suggest that 10^{19} 'life convenient' planets now conservative the chance presence of:

- -c) a required atmosphere between 0.8 and 1.2 atmosphere: 1 : 10,000 planets
- -d) at least 20% water / land: (H_2O is common in universe) 1 : 1,000 planets
- -e) fluid iron core with magnetism: 1 : 100 planets
- -f) volcanism + tectonics: 1 : 10 planets

For a 'life convenient' planet is the presence of a magnetic field and an atmosphere with O_2 / O_3 essential to the cosmic radiation from the universe and the radiation of the star itself. Volcanism and tectonics are important for the recycling of material on the planet.

In a *conservative estimate* of the author would result in $10^{19} \times 10^{-10} = 10^9$ or 1 billion planets *in the universe* with conditions in accordance with planet Earth. That is a very significant number of quantitative but overall only **one planet with living matter per 10 galaxies and suitable for life!**

Given the immense number of galaxies in the universe are planets like the Earth, however, extremely rare

-3) Living matter will be approximately 1 planet per 10 billion stars:

In practice on many more planets above requirements naturally at the same time.

More realistic treasure author the chance of living matter now to 1 planet with life per 10 billion stars.

In the every galaxy than overall only about *10 – 20 planets* to be expected with further or less advanced forms of living matter as found on Earth. With a view to any future for mankind traveling in space and looking for an alternative planet like Earth that number however is shocking small! The distances to such 'life suitable' planets in the Milky Way galaxy may be anyhow many thousands of light years! For all aliens as well!

-4) Living matter omnipresent in the universe:

However, it is also completely misguided to think the planet Earth is the only place in the universe with 'living matter'. The phenomenon of biochemical life is quite rare but is widely distributed in the universe. Systems with living matter develop completely autonomous everywhere in the universe without any help or 'fertilization' from the outside and especially without any *supernatural* influence.

On all suitable planets develops the phenomenon *completely spontaneous* life. All life forms in the universe be based biochemical seen without exception on **Biochemical Pathways** and, therefore, on the exact same biochemical systems as we know it on planet Earth.

-5) Intelligence destroys planet:

On the most conveniently situated planets in the universe evolution leads to the development of intelligence and to ever more intelligent creatures. In a relatively short period of several thousand years that intelligence results to

all sorts of ongoing developments in the field of engineering, technology, medicine, bio-industrial, fishing and agricultural food production and increase of the population in spite of wars.

On all planets with *intelligent human-like beings* and development of medicine adopted the population thereby in time cumulative in spite of epidemics, diseases, wars and famines. Also, the cumulative energy consumption and thus the CO₂ production by burning in the carboniferous period' of this planet laid down CO₂ in the form of coal, petroleum and natural gas.

All planets, where *intelligence beings* can develop, in the past have gone through such a 'carboniferous period' which in a period of many tens of millions of years a large part of the CO₂ gas / HCO₃⁻ ions are fixated through plant material into coal, petroleum and natural gas.

On planet Earth that captured carbon is burnt in a period of roughly two centuries and converted to CO₂ gas. Planet Earth now is reaching a second 'carboniferous' period!

The development of knowledge and intelligence stems from the natural selection process and is closely linked to survival instinct and the 'survival of the fittest'. This development also results in prosperity and in intelligent beings.

The combination of technology, medicines leads to an ever-increasing size of the population and results in an ever-increasing pressure of this *intelligent beings* on the ecosystems of their planet. That population pressure is ultimately in no respect more in proportion with natural ecosystems present on the planet. On planet Earth that point in fact was already reached around 1550-1600. So far before the start of the industrial revolution!

On all planets with high intelligent beings leads the *unstoppable material greed* of these intelligent beings inevitable return in the long run to a destruction of ecosystems on their planet and thus of the total environment of the planet. That greed leads to inevitable demise of these intelligent beings themselves.

APPENDIX 11: FRAGILE STRUCTURE DNA / RNA REDUCES SPEED OF LIVING MATTER IN UNIVERSE:

-1) Can the universe / USS be colonized by mankind, human beings or by aliens?

In the universe all the stars are grouped within one of the 4 – 20 billion galaxies. The distances between galaxies normally are hundreds of thousands to some million light years. Within each galaxy all stars are at distances of at least a few light years of each other. For human standards these distances between stars are immense and practically not to bridge unless one itself could move with the *speed of light* or even greater speeds. That spacecraft must have enough energy to reach these speeds as well enough energy to slow down in time again!

On Earth is speculated about the colonization of the planet Mars and of the galaxy. Science philosophies the possibility of reaching other places in the universe accessible by spaceships traveling at light speeds and / or even quicker through the universe through supposed 'wormholes'.

-2) Effects of speed on RNA/DNA of human beings, animals, plants and aliens:

This phantasy of reaching other 'Earth like' planets ignores *completely* the effects of speed in the universe on the atom and especially the impact of speed on the stability of the RNA / DNA that is present in *all* living organisms and bonds in present proteins in living matter.

Be underestimated the effects of long-term weightlessness and its consequences still further by a previous bone loss, muscle weakening and the effects of the prolonged exposed to cosmic radiation. Each of these aspects in itself is ultimately deadly for all vegetable and animal organisms and forms of living matter.

-3) Stability RNA / DNA hydrogen bonds explains all the living organisms within fairly tight speeds limitations at +/- 300 km/sec relative to planet Earth or any planet of departure in the USS:

The biochemical control mechanism, the genetic material and the protein formation in all vegetable and animal material is based on RNA and DNA. The double helixes are held together by relatively weak hydrogen bonds. That hydrogen bonds are essentially free fragile physical *charge bindings*, not elementary. The strength of these hydrogen bonds depend on the speed of living matter in the universe relative to **center C** of the universe and **center R1** a of the galaxy.

-4) For living beings speed in the universe should not be too high nor too low:

For the proper functioning of the RNA/DNA the strength of these hydrogen bonds may be *neither too strong nor too weak!*

-) In case the speed of a spacecraft in the universe relative to the Earth / planet of departure increases than the *strength* of these hydrogen bonds in RNA / DNA increases correspondingly. Eventually, these hydrogen bonds become so strong that both halves of the double helix of the DNA become to separate too difficult and ultimately don't separate at all anymore. Besides that the cell gets problems with the protein synthesis. All living cell get in trouble increasingly with cell division. Above about 300 km/s the cell isn't able to reproduce. A large increase in speed in the universe relative to **center C** and **center R1 A** of the galaxy results anyway to the death of all living plant and animal organisms on board of the spacecraft.

-) In case the speed in the universe relative to the Earth / planet of departure decreases relative to the **center C** of the universe / **R1 A** of the galaxy correspondingly the *strength* of the hydrogen bonds in the DNA decrease. Then the hydrogen bonds between the two halves of the DNA decreases. After cell division these forces are not fast enough to link again for the formation of new DNA, genes and chromosomes. Already much earlier problems arise with protein synthesis. A large decrease (> 300 km/s) in speed in the universe relative to **C** and **R1 A** results in the death of all living organisms on board as well.

-5) Major rate limiting in the universe for all living matter:

The stability and strength of the hydrogen bonds in the RNA / DNA results in radical speed limits for all forms of living matter in the universe. For all forms of living matter in the universe speeds are limited to approximately 300 km/sec or net only 1 % of the speed of light relative to the Earth or planet of departure.

Berry's speed limitation to net about 1 % of the speed of light to all forms of living matter in the universe!

This stringent speed restriction reduces the possibility of space travel for humanity outside our solar system in to almost absolute zero! The man is 100% caught on Earth.

-6) This speed limit applies to all forms of life in the universe:

That limitation of speed in the universe also applies to all (intelligent) beings elsewhere in the universe with the intention to travel to Earth. The colonization of the Earth by alien 'civilizations' is impossible as well.

-7) Giant distances between stars:

For living people and a limit of 300 km/s crossing a distance of 1 light year in the universe requires approximately one thousand years to realize. To reach the nearest star, located at just 3 - 4 light years, requires a travel period of approximately *three to four thousand* years in an environment extremely dangerous and hostile for living matter! This because the intense cosmic radiation, weightlessness, the occurrence of an unstoppable bone loss and further weakening of the musculature. By this speed limit no 'cultures' in the universe can reach any other 'cultures'. They will never meet each other physically.

Endless and literally 'lifelong' capture of generations of plants, humans and animals locked in a relatively small spaceship that will cause major social tensions on board. Space travel to outside our solar system in terms of necessary travel time should be considered as absolutely impossible despite all science fiction! The distances between stars in universe are way too big for the phenomenon to 'life hopping' from star to star.

Space travel between galaxies via 'wormholes' are already completely excluded because the DNA than completely is blocked and all living matter dies. Because of the universe cycle all places in the universe always have exact the same universe clock time. Travelling by 'wormholes' are based on myths, which by some scientists.

The relatively cold planet Mars for mankind in the most absolute sense possible object in the universe for colonization'. This planet, however, is completely unsuitable for large groups of people.

-8) Colonization of the universe by humanity is excluded:

For mankind planet Earth is the only suitable residence in this universe. For the full 100% mankind is depending on the 'well-being' of this planet and of the ecosystems therein. The only future for humanity is Earth both in the short and in the long term (ten) thousands of years.

Especially since World War II an extremely varied technology has been developed. Now mankind is seriously problem due to overcharging the ecosystems on this planet by a) destroying these system thoroughly, b) pollution and 3) the greenhouse effect of the atmosphere.

-9) using up Earth by overpopulation:

In little more than half a century mankind plundered planet Earth lives completely and thoroughly due to the approximately *20 to 40 fold* ecologically overpopulation of mankind. From the point of view of *sustainability* is on Earth only seat is for a *prosperous population* of up to approximately 300 to 400 million people who then can be in balance with the Earth's ecosystems.

The nowadays overpopulation creates scarcity of agricultural land, food, raw materials and energy and results to high prices in the long term. Within a few decades this will inevitably cause major armed conflicts in which billions of people worldwide devastating life will. This large-scale conflicts and its aftermath will further destroy the remaining ecosystems. The dominance of mankind will disappear. The human mind will leave one big mess on Earth.

APPENDIX 12: OVERALL TIMETABLE DEVELOPMENT OF LIVING MATTER:

1) Introduction:

Conveniently situated planets possess:

-) a slight atmosphere of 0.8 – 1.2 bar consisting mainly of nitrogen,
-) a distribution of land/water between 20% and 80%,
-) a liquid iron/manganese core resulting in magnetism and tectonics.

SCHEDULE 1: TIME TABLE DEVELOPING LIVING MATTER:

3 Phases and 9 macro steps in development of living matter:

Such 'life' favorable planets will go through a process with the development from 'dead' inorganic material to 'living' organic material in overall 3 phases within which the following 9 macro steps can be distinguished:

Phase I: Development biochemistry of 'dead' matter on mono molecular level:

- a) Development of anaerobic/aerobic photosynthesis and formation of glucose: about 0.5 million years,
 - b) Developing citric acid cycle, fatty acid and amino acid synthesis cycle: approximately 2 - 3 million years,
 - c) Development of Biochemical Pathways (BP) + sub bio-chips: approx. 2 - 5 million years,
- The development on this mono-molecular level is framed within the six laws of Biochemistry,

Phase II: Development of biochemistry 'dead' matter on polymer level:

- d) A control of the monomeric level by RNA / DNA polymers: about 2 - 15 million years,
- e) Development cell walls: about 2 - 15 million years,
- f) Functioning of a cell with the blueprint: the RNA / DNA: about 25 million years,

Phase III: development of biochemistry with 'living' matter and reproducible cells:

- g) Mono-cells with asexual reproduction through RNA organized into chromosomes: about 100 million years,
- h) Mono-cells with sexual reproduction: about 250 million years.
- i) Development of systems of polymer-cells: about 0.5 – 1,5 billion years.

Comments Schedule 1:

1) Above dates are very global estimates and give an indication of the required length of time. The estimates are quite conservative. The developments may take place in a shorter period of time.

2) most essential and crucial characteristic of *living matter* is that through cell division was created and that it can *die*. All as 'living matter get objects is indeed *dead* and will disintegrate sooner or later. All living matter anyway has a finite lifespan. (**Law I of the biochemistry**).

3) That dying forces living matter to develop a system of reproduction by RNA / DNA of:

- a) The functioning of the entire biochemistry of the cell,
- b) The structure and function of cell contents and the cell wall,
- c) The development of sexual reproduction asexual and then.

It took quite long time may be 25 – 100 million years before the asexual reproduction was regulated as well the protein synthesis via the RNA in vegetable organisms.

5) The asexual reproduction of living plant cells could only take place after the RNA was formed and after all the properties of the cell were fully recorded in genes and chromosomes. Only with the asexual reproduction of living cells there was living matter that could die.

6) All currently present on Earth single and multicellular organisms possess a nucleus with chromosomes based on RNA / DNA. All living cells have the biochemical (to) control of the cell as well as about the possibility / potency of a sexual and/or asexual reproduction.

The method of the biochemistry of the 'life' in the cell to send also revealed useful for reproduction and for maintaining the species.

7) The long path of 'dead' matter to 'living' matter takes a time period of tens of millions of years on rather undisturbed places. The periodic table allows just *one biochemical basis system* like Biochemical Pathways. On the monomolecular level went undisturbed and partly parallel development through the establishment of:

- a) The anaerobic / aerobic photosynthesis and ADP / ATP,
- b) The citric acid cycle, the fatty acid cycle + associated enzymes,
- c) The entire system of Biochemical Pathways + enzymes / coenzymes,
- d) Polymers and the formation of the cell wall,
- e) Control of the plant cell via RNA,
- f) The control of cells via DNA for (a)sexual reproduction.

8) The development of living matter is not possible if the periodic table on the monomolecular level should have contained *two or more biochemical basic systems* like Biochemical Pathways next to each other.

9) In that case, these biochemical basic systems on the split to a *mono-molecular just* becoming uncoordinated by each other and mutually inhibit both physically and chemically. Both systems would disrupt each other continuous mutual. Under the conditions of two or more similar systems like BP cannot develop the biochemistry of living matter. 'Living matter' would not have been possible.

10) The deduction in **Chapter 7** shows that the periodic table allows only one system as Biochemical Pathways.

APPENDIX 13: DEVELOPMENT LIVING MATTER ON EARTH LIKE PLANETS

-A declaration for the development of living matter on Earth and elsewhere in universe / USS:

The big question is still how a biochemical system with characteristics of living matter could develop from the approximately 90 absolutely stable, 'dead', elements of the periodic table, the 1 – 2 million possible mono-molecules and about 1 – 2 billion polymer-molecules.

That development of 'living matter' according to the author outlined here is not only true for planet Earth but universe-wide for of billions of planets with enough water and thus with the potential for the development of 'living matter'.

In the development of the biochemistry of living matter on Earth for the time being, the author differentiates 13 consecutive stages (I – XIII) that go from pure 'dead' matter to the organizational structure of 'living matter' that can die.

PHASE I): The initial phase:

Emergence of a wide variety of mono-molecules which and parts of Biochemical Pathways (BP):

-1) At supernovae and Big Bangs at the origin of galaxies only the elements of the periodic table are formed. After these supernovae all formed oxygen is fixed in the form of chemical compounds. At the start of the planet there is no free oxygen and the atmosphere of the planet is completely anaerobic and filled with all kinds of gases mainly N₂, H₂O, H₂S, CO₂, SO₂, CH₄, CO, NH₃ etc.

Quite soon after finishing the formation process of the planets (including the Earth) and after cooling completely oxygen-free atmosphere water vapor condenses and anaerobic oceans arise. A large part of the gases (SO₂, H₂S and NH₃) dissolves in water and form ions under formation of acids, bases and salts. That water contains a wide variety of organic and inorganic molecules as left over after the H₂ supernova explosion / Big Bangs. On all planets in universe a large variety of minerals is present. Broadly the same minerals as found on earth now.

For the further development of living matter the surface of the planet should be covered for about 20-80% covered with water / land.

PHASE II) Tectonics create concentration points on land with molecules important for the development of living matter:

-2) Tectonic movements on the planet (Earth) results in dry areas (re) areas. In that dry areas by precipitation in conjunction with local large evaporation much higher concentrations of molecules occur for example in drying lakes and seas. Tectonics and contiguous land is essential for the formation of such evaporating more or less dry seas / lakes creating places where over millions of years (strong) increased concentrations of molecules is possible.

PHASE III) Formation in an anaerobic environment of all kinds of molecules:

-3) By lightning discharges and UV radiation and radical formation the formation of all kinds of molecules is possible. Especially molecules built up around the elements C, H, O, N and S. A wide variety of organic and an-organic molecules is formed. By the absence of free oxygen these molecules are relative stable. In the presence of water they can react chemically with other molecules. Over a period of several millions of years through radical reactions due to lightning discharges a huge variety of hundreds of millions of different organic molecules has been formed. These molecules concentrate in these dry evaporated lakes / seas.

On those through tectonics formed concentration points a great variety of organic molecules is to expect and in relatively high concentrations. This results in a locally available 'primordial soup' which also all kinds of enzymes. In this 'primordial soup' all kind of biochemically reactions occur.

-4) During this process all kind of organic molecules are formed that somewhere fit within: 1) photosynthesis, 2) the citric acid cycle, the fatty acid cycle and the amino acid synthesis / degradation, 3) the chip Biochemical Pathways, 4) or can be used as enzyme / coenzyme. The biochip Biochemical Pathways is constructed bit by bit.

-5) On these concentration points accumulate all kinds of molecules and enzymes/co-enzymes. All kind of biochemical reactions occur as well as polymerization reactions whether or not fitting into the biochemistry of 'living' matter.

Such concentration points should be unchanged over many thousands / millions years. That is only possible if there is a substantial piece of contiguous dry land is present with a size of at least 20% of the surface of the planet. According to the author, the development of the biochemistry of living matter only occur on dry land.

PHASE IV) Photosynthesis creates glucose; the (only) driving force behind the development of Biochemical Pathways (BP):

-6) In time on such concentration points arise all kinds of organic bonds such as *chlorophyll* and the *ADP* (*adenosine diphosphate*). After approximately 0.5 million years these two molecules start anaerobic photosynthesis in the 'primordial soup' on a *purely biochemical way*. Under the influence of sunlight from the star glucose is formed from CO₂ and H₂O. This photosynthesis universe-wide is exactly equal and leads only to the formation of *left-turning* glucose.

The start-up of this *anaerobic photosynthesis* forms the first major milestone in the development of living matter. No oxygen is released.

From that point on continuous glucose and thus chemical binding energy is added to the ecosystem of the local 'primordial soup' in the form of chemical covalent charge bonds (+ L2cb) followed by these bonds between the elements C, H, O, N, S and P.

Later follows the *aerobic photosynthesis* and oxygen is released. In both cases, the *left-turning glucose* and oxygen on pure (bio) chemical way formed. There is still no question of 'living matter'. Glucose is the chemical basis for the formation of fatty acids and amino acids.

The release of free O₂ is not a problem as long as the amount of oxygen in the atmosphere not exceeding a few percentage points. The low O₂ content significantly slows down the oxidation of already formed connections and prevents the oxidation.

-7) Lightning discharges in a nitrogen and oxygen-containing atmosphere with less than 1 - 2% O₂ results in the formation of ozone (O₃) leading to a further increase in the number of chemical compounds. The presence of free oxygen results in a huge increase in the number of chemical reaction products due to the formation of fatty acids, amino acids, aldehydes, alcohols and ketones, acetals, half acetals etc. The resulting oxygen in photosynthesis is processed in both organic and inorganic compounds causing the oxygen content in the atmosphere remains relatively low for a long time.

-8) The *left-turning glucose* submitted by photosynthesis is the continuous engine / driving force behind the chemical construction of organic molecules and thus the formation of ultimately approximately 1 – 2 million different mono-molecules with emphasis on the formation of *left-turning organic* molecules. In time are realized all compounds and enzymes necessary for settling of the entire citric acid cycle, fatty acid cycle and amino acid synthesis.

-9) The continuous formation of glucose is the relentless driving force for de development the citric acid cycle, the fatty acid cycle, the amino acid synthesis and the formation of enzymes / coenzymes . After about 2 - 3 million years these 3 cycles eventually are fully in operation under still completely 'lifeless' conditions. These three cycles are centrally located within Biochemical Pathways and are mutually linked. In practice BP will operate mono-molecular level as the central biochemical computer chip / processor within the biochemistry of living matter.

PHASE V) The central biochip Biochemical Pathways is formed automatically by itself:

-10) Any formed organic molecule that fits in Biochemical Pathways in BP is useful. In that case immediately forms itself a chunk of this bio chip (s) waiting for the moment that the enzyme is formed for going through the following chemical reaction step. In time these whole cycles will be completed. The citric acid cycle can already be active the moment all necessary enzymes in this 'primordial soup' are present. Photosynthesis provides ever new glucose. This glucose is the driving force for the biochemically development of living matter.

-11) For each reaction step in Biochemical Pathways one specific enzyme and sometimes one or more co-enzyme(s) are needed. Keeping all these necessary molecules / enzymes together in one place can only be realized on concentration points on dry land and in places where the conditions are the same for hundreds of thousands years. Under those conditions locally (an)aerobic aqueous 'primordial soup' can develop with all organic molecules and all enzymes / coenzymes needed for going through both the entire citric acid cycle as of the fatty acid cycle and amino acid synthesis. Without life the central biochip BP of living matter is realized by itself.

-12) So totally controlled biochemical reactions by enzymes occur far before there is 'living matter' that can reproduce asexually and can die. A large part of these biochemical reactions wraps itself already according to the templates of BP and BP, etc. and so according to the biochemistry which is later found in living matter. Over the course of many millennia all parts come from BP. BP develops with the time still further. In a strict sense this is still completely 'lifeless' and dead matter.

-13) Enzymes play a crucial role in this process. Through a physical absorption binding or charge binding with the enzyme the organic mono-molecule temporarily gets an unresolved state. The enzyme holds the mono-molecule in such position that only the chemical reaction can occur which exactly fits into the chain or in the cycle of BP.

-14) Biochemical reactions can only unwinding in water. Only in water next to each other are to solve mono-molecules in the physical state of:

a) *gaseous and not charged molecules*: the gases,

b) *not gaseous and charged molecules*: the ions,

c) *not gaseous and not charged molecules*: the 'no-pressure' molecules.

In any other 100% pure liquids then water charged particles aren't to solve as ions.

-15) Out of the total collection of 1 – 2 million organic mono-molecules in a period of about 2 - 3 million years the citric acid cycle, the fatty acid cycle and amino acids are realized and thus BP completely.

-16) With BP there is still no 'living matter'! However the biochemistry of that living matter is function already on full scale driven by the glucose formed by the anaerobic and aerobic photosynthesis. In the physical and chemical properties of the elements C, H, O, N, S and P and mono-molecules the citric acid cycle, fatty acid cycle and thus Biochemical Pathways in fact already are *incorporated*. The establishment of BP cannot be qualified as 'supernatural'. In the contrary every additional physically, chemically or even a divine force in this process would block the development of BP completely!

-17) Starting from the periodic table in the whole universe only one system is possible like BP starting with the anaerobic and aerobic photosynthesis. Universe-wide this development of 'living matter' is the same way on all planets with enough land / water between about 20 – 80% of the surface of the planet. That dry land must consist of contiguous land. The full development of BP on Earth took estimated 5 – 10 million years to complete.

PHASE VI) Dead matter with the biochemistry of living matter:

-18) Partly parallel goes the development of the control system of biochemical reactions through the formation of the basic molecules of RNA / DNA. They are the molds for the formation of amino acids, proteins and phosphorus lipids for the construction of cell wall. Very slowly over a period of millions of years the entire biochemistry of living matter starts as already biochemical programmed in the elements of the periodic table excluding all eventually divine forces!

PHASE VII) Construction of debris of the RNA / DNA:

-19) Out of basic molecules parts of RNA / DNA pieces of the single helix are formed. These pieces themselves form a part of the double helix of the RNA / DNA. This results in the long term in the first relatively simple biochemical shaped proteins and later more and more complicated proteins. Also be formed molecules usable within the cell wall where phosphorus lipid structures inside the cell can be formed. This process takes probably takes more time and to estimate the author about 5 - 15 million years to complete.

-20) On relatively dry places and concentration points in the dry regions the entire biochemistry of living matter comes alive (without living matter!) together with the further expansion of the RNA / DNA and thus of the protein formation. It is still completely dead matter.

This RNA / DNA is the chemical blueprint for both the biochemical function of that cell as for the structure of the cell. This process of creation of *reproducible RNA / DNA* requires an estimated about 25 million years. In the meantime, also the system arranging the RNA / DNA in genes and chromosomes.

PHASE VIII) Cell wall formation, pro-cells and eventually real cells with a cell wall:

-21) With these polymers as phosphorus lipids are to construct structures with the characteristics of a semipermeable cell wall. This is necessary to hold the reaction medium water together and to prevent this reaction medium for flowing away and / or evaporation. Cells are small volumes of *water* surrounded by a semipermeable cell wall resulting to the formation of pre-cells with RNA / DNA. They control the biochemistry and the formation of proteins inside the cell.

-22) This cell wall in time becomes selective enough for the cell needed nutrients and building materials and to exclude the waste from the biochemical life process in the cell. This try and error process results in cells and a biochemistry getting better and increasing in detail.

-23) All cells work as a biochemical factory / complex subject to 'wear' and 'internal pollution' of the cell. This pro-cells can biochemical function active only a limited time (order size up to several years) after which they biochemical worn out and / or soiled and so on are and perish. This is the first step towards developing a system of increasingly rapid reproduction of the cell in the form of reproduction.

According to author there still is no 'living matter'.

PHASE IX) Capture operation and complete control cell in the RNA / DNA and chromosomes:

-24) Via a try and error RNA / DNA is becoming more and more structured in genes. These proto-genes are bundled to forerunners of chromosomes in which information is bundled on the biochemistry of the cell, the total synthesis of proteins and its reproduction.

The process eventually leads to the capture of the entire biochemistry of the cell in a whole blueprint. The RNA / DNA is grouped in genes and chromosomes. Those genes contain the entire biochemical process and formation process of the cell completely.

-25) In time the biochemistry of the proto-cells and the cell is made completely and biochemically controlled. This cell structure may be destroyed or through pollution / radiation from himself. Still it cannot really die but that basic phenomenon of living matter is getting closer and closer.

-26) In a period of approximately 100 million years this 'dead' organic matter transforms very slowly but steadily into forms of living cells and corresponding biochemistry. This process can catch up against the thermodynamics because photosynthesis provide energy continuously through the formation of glucose and oxygen.

PHASE X) Operation cell via RNA/DNA also suitable for reproduction:

-27) The blueprint of the cell by RNA / DNA contains all the (chemically) information about the building / structure and on the working of the cell. The RNA / DNA is therefore also applicable for the asexual reproduction.

The RNA and later the DNA organizes slowly up to control system in which the right proteins are formed, the biochemical information for the control of the cell is locked up and this information is arranged in a double helix. The end of this process is cell like structures:

- a) eventually completely surrounded by a semipermeable, cell wall
- b) all biochemical information of the cell arranged in RNA / DNA grouped in genes / chromosomes.

-28) These proto-cell structures are already biochemically active in not completely closed cell structures. However even than already internal pollute and 'wear out' occur by chemical pollution and cosmic radiation. Such active functioning open proto-cell structures may get a *finite lifespan* of may be at most tens of years.

-29) The inextricably linked to biochemical activity phenomenon of destruction / disintegration requires this proto-cells still in the direction of developing capabilities to be able to duplicate itself through a system of asexual reproduction. That process is in the time ever faster and is becoming more efficient.

-30) The levels I – X developed proto-cells despite all biochemical activities still are no real living matter. These proto-cells despite all biochemical activities cannot really 'die' or reproduce themselves.

PHASE XI) Transition of dead matter into living matter; the formation of the closed cell:

-31) Living matter is the case if:

- a) Cell structures are fully closed and surrounded with a semipermeable wall together with
- b) A cell able to *asexual reproduction*,
- c) The cell can really die.

The formation of such living cell structures all information is fixed in the RNA / DNA in chromosomes probably takes most time; The author estimates this a period of approximately 100 - 150 million years to complete.

PHASE XII) of ' living matter ' first time at an asexual cell communication:

-32) Living matter is ultimately the case as soon the cell / organism can reproduce at least on an asexual way such as (blue) algae and bacteria.

The chromosomes contain the entire blueprint of the biochemical function as of the structure, the construction of the cell and the reproduction thereof. That information is logged in the RNA / DNA and that information is fully transferred during the asexual reproduction.

-33) The fully enclosed of the cell by a cell wall and stage of asexual reproduction requires a period of estimated about 100 – 150 million years.

That fully enclosed hitting the cell by a cell wall also is inextricably associated with a contamination of the cell and thus the *death* of the cell / organisms. Besides the biochemistry death of living cells is one of the most basic characteristics of living matter!

-34) All mono-cellular organisms like algae, blue-green, different types of aerobic and anaerobic bacteria, autotrophic bacteria, fungi and all higher organisms without exception possess the ability to reproduce themselves asexually or sexually this to compensate this inevitable death of the cell.

-35) Viruses and phages multiply asexually on a purely parasitic way by invade a living cell and reproduce at the expense of the host cell. Without exception all viruses and phages are mortal on a short or long term. Viruses and phages are entirely dependent on their reproduction through living organisms with a cell nucleus.

PHASE XIII) Living matter:

-36) The structure of the cell wall, the cell contents and converting all the information in the RNA / DNA takes about 100 million years before the asexual reproduction is realized. This is probably first to single-celled organisms based at the vegetable based RNA. Relatively short followed by the asexual reproduction of single-celled organisms based on DNA.

-37) All forms of living matter apply their biochemistry ever to bring it to the 'BP-chip' to link and these centrally on BP can operate. In all forms of living matter there is a driving force and that is only available through the conversion of covalent binding (+ L2cb) energy in heat / infrared photons. That is always in the form of:

- a) entry into or termination of covalent charge bindings (shifting one electron pair),
- b) through the release of one electron (half-radical reactions in the autotrophic bacteria, photosynthesis) and
- c) through the release of a proton (proton reactions) and
- d) never via formation of two radical atoms / molecules.

-38) In all cases the origin of the chemical binding energy directly or indirectly is associated to the left-turning glucose of the photosynthesis. Universe-wide this left-turning glucose forms the same *basis* for the construction left-turning carbohydrates, fatty acids and amino acids.

-39) This process of asexual organisms tot sexual organisms takes probably about another 50-150 million years.

-40) Throughout the universe living cells are found which are reproducible asexual and, ultimately, through sexual reproduction. All cells are based on a blueprint in the form of RNA or DNA ordered in genes and chromosomes. Each cell/organism has a limited lifespan and is therefore dead.

-42) All aerobic and anaerobic life forms on Earth, even the most extraordinary and bizarre, founded biochemical seen on one and the same basic system: the carbon chemistry (C, H, O, N, S and P), some (amphoteric) metal (K, Na, Ca, Mg, Fe, Co, Se, Si, V etc.) and on the biochemical plans by BP and by linking to BP monomolecular schedules.

All biochemical processes and reactions without exception take place in the presence of the reaction medium water.

-43) For all living matter in the universe the biochemical conditions are derived by the author and formulated in the *6 laws of biochemistry*.

APPENDIX 14: OTHER BIOCHEMICAL NICHE THAN BIOCHEMICAL PATHWAYS?

-1) Deriving all possible biochemical cycles and chains:

On the basis of the periodic table approximately 1 – 2 million mono-molecules are to construct in all conceivable physical states. In a period of approximately 10 – 15 years all atoms, molecules, their spatial structures and their physical state are to digitalize. All atoms and mono-molecules are to sample in one large computer file. This also applies to all enzymes / coenzymes.

Using computer operation from this about 1 – 2 million digital-made mono-molecules to analyze *all* theoretically possible *biochemical chains* and *all biochemical cycles*. Those chains and cycles consist of digital-made mono-molecules that in physically or chemically mutually differ on just *one point*. These chains and cycles fulfill the min / max 1 principle as expressed in **document F1f**.

Such an analysis results anyhow in all on Earth known biochemical cycles such as a) the citric acid cycle, b) the fatty acid cycle, c) the amino acid synthesis, 4) the whole BP and 5) all linking biochemical sub-cycles to BP as found on Earth and there derived via research.

-2) Are theoretically other cycles still possible?:

Through this analysis is to determine whether from those total collection of 1 – 2 million mono-molecules still other biochemical *one-sided* and *double-sided* cycles are possible other than the citric acid cycle, fatty acid cycle and amino acid synthesis. That would be surprising! Especially when this new found cycles can be linked to Biochemical Pathways.

Could those possibly found cycles be an alternative for the now known *citric acid cycle*, the *fatty acid cycle* or to build up / breakdown of monosaccharides, mono-fatty acids and amino acids? In that case, on the basis of the carbon chemistry biochemical on Earth other life forms could be possible but not (yet) found at Earth!

This computer analysis of mono-molecules may result in the following:

= 1) The analysis results only in photosynthesis with formation of *the counter clockwise glucose, citric acid cycle, fatty acid cycle and amino acid synthesis*.

In that case *Biochemical Pathways* is the only *biochemical possibility* for the biochemistry of living matter. Then on a scientifically irrefutable way is confirmed that in the universe BP is everywhere the same. All living matter is based on exactly the same biochemically fundament for living matter as found on planet Earth!

In case theoretically a photosynthesis would be possible that results in the formation of another mono-saccharide than left handed glucose or in both clockwise and counterclockwise glucose than these systems are mixing on the mono-molecular level. The consequence is that the biochemistry of living matter cannot develop! That is only possible in just one mono-saccharide.

= 2) The analysis results in one or more *bilateral* developable cycles *in addition to the now known citric acid cycle, fatty acid and amino acid synthesis cycle which might be possible on Earth*.

In this case first one will have to search *that new-found (theoretical cycle(s))* in the biochemistry of living matter on Earth. If such alternative cycles are found on Earth then those new cycles undoubtedly are to connect with Biochemical Pathways (BP). In that case the biochemical diagrams of BP should be adjusted substantially. BP is then expanded and becomes much more complex. All living matter is still based on the same biochemical system BP.

= 3) The analysis results in one or more *bilateral than the developable cycles: citric acid cycle, fatty acid and amino acid synthesis cycle that are found on Earth but are not to connect with Biochemical Pathways*:

Encountering this theoretical analysis to settle on other *bilateral* cycles that *are found* on Earth but *not to be* linked to BP and hence to the citric acid cycle, the fatty acid and amino acid synthesis cycle. Then the structure of the central biochip in living matter on other places in the universe may differ on essential points and might be presumably *much more extensive* than *Biochemical Pathways* on Earth!

At other locations in the universe because of the left-turning glucose by photosynthesis all forms of life will be based on the citric acid cycle (carbohydrates), the fatty acid cycle (fatty acids) and the amino acid synthesis. The schemas of BP will be much more extensive and considerably more complex.

= 4) The computer analysis results in one or more *bilateral than the citric acid cycle, the fatty acid and amino acid synthesis cycle that are not found on Earth and are n BP are to connect:*

However, if *two or more* bilateral developable biochemical cycles are found which are not found on earth or on BP are to connect then let the elements C, H, N, O, S and P open the possibility for other **biochemical systems substantially**. Because of the photosynthesis is the development of Biochemistry also here started from the left-turning glucose. In any case, develops through the photosynthesis also BP.

That new cycles would then biochemical equivalent to both: 1) the citric acid cycle (construction/dismantling carbohydrates), 2) the fatty acid cycle (build-up and breakdown fatty acids) with a 3) the amino acid synthesis. In the event that those 1 – 2 billion molecules result in two or more basic biochemical systems as BP is according to the author the development of living matter than no more is not possible.

-3) only one system possible if BP:

On the basis of the Chapter 7 *bottom-up deduction* is carried out according to author for the time being, no reason to assume that out of the total collection of 1 – 2 billion molecules *more than just one* citric acid cycle, one fatty acid cycle and one amino acid synthesis. It falls above ability = 4) in advance.

According to the author let the periodic table and on this basis, universe-wide to form 1 – 2 billion molecules only one bio processor as Biochemical Pathways. BP with possibly still add extensions is compelling at the base of the biochemistry of all forms of living matter on Earth and in the universe. For living matter universe-wide applies exactly the same biochemical base system.

On Earth is the biochemistry in living matter as far as the works according to author that virtually all biochemical possibilities be used somewhere in the ecosystems that on the basis of the periodic table and within BP. All biochemical possibilities are to find somewhere back in living matter on Earth.

-4) Genetic manipulation:

These changes of properties of chromosomes leads to partly artificial and therefore unnatural organisms. Bacteria can produce chemical compounds or certain desired plants that provide protection against attack by insects, fungi and bacteria.

In addition to positive application can also easily be used for negative purposes this technique. At genetic engineering rests the biochemistry still on BP.

APPENDIX 15: SOUL OF LIVING / DEAD ORGANISMS:

-1) How is the 'soul':

All vertebrate organisms possess brain where the signals from the senses are processed and from where the organism is controlled. In all vertebrates this brain radiation is associated with an electro-magnetic field which is the result of biochemical reactions. This electro-magnetic field that is measurable outside the brain. For the author that electromagnetic field is equivalent to the phenomenon of the 'soul'.

Maintaining this 'soul' requires a driving force as which is the case with 'life' of the organism itself. The driving force behind the emission of this electromagnetic field is derived from biochemical reactions in the brain due to the conversion of specific glucose in H₂O and CO₂. The variations and changes in the frequencies and strength of that, in the brain generated, electromagnetic field are measurable through an EEG.

That changes in the electromagnetic field and field strength or the 'soul' in life, all-sided emitted with the speed of light. All vertebrate creatures exhibit equal man correspondingly its own characteristic form of 'soul'. Each individual human / animal with brain activity generates its own body-bound 'soul'. All vertebrates like humans possess a 'soul'.

-2) Only look of the 'soul' throughout life:

This electromagnetic radiation or 'soul' can only be generated during the *phase of life* of the organism. That appearance does not take place after death. With the death, the blood supply to the brain stops and so stops the supply of glucose and oxygen. The brain activity stops completely and thus the driving force behind the emission of an electromagnetic field and 'soul'.

In all vertebrates is the 'soul' just as mortal as the body that the 'soul'! The death of every human / animal literally go hand in hand with the 'de-souling' of the body. In time seen death and de-souling are an one-sided and irreversible process. Previously emitted radiation of the soul disappears within the universe spherical-shell. All forms of radiation and the 'soul' move at the speed of light from their origin.

-3) All radiation is transferred into protons / electrons and hydrogen again:

In document **F1b** is derived that all conceivable types of radiation contain: a) a certain amount of mass, b) charge and c) magnetic spin. During the universe cycle (**G7 + G8**) all types of radiation are transformed back into just ordinary protons / electrons and hydrogen atoms / molecules within a period of 14 - 18 billion years. An endlessly 'soul' is technically and physically not possible.

-4) No reincarnation possible:

The electromagnetic field and 'soul' of one organism cannot just hacking:

- a) The biochemistry of the brain of any other vertebrate or invertebrate organism,
- b) An egg or a fetus in order to remain there and to 'take' possession thereof to reincarnate!

Both in technical and in biochemical respect reincarnation is impossibility. Your *own 'personal 'soul'* cannot inherited and therefore live endless and forever.

-5) Conclusion:

The 'soul' of every human being / vertebrate animal is as mortal as the individual person / animal. Even one egg twins have two separate souls that are completely separated.

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1^e version dated 2000 is not published,

2^e version on the internet dated August 1, 2006,

3^e version on internet dated 18 April / June 22, 2009,

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