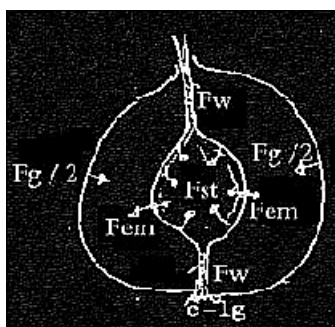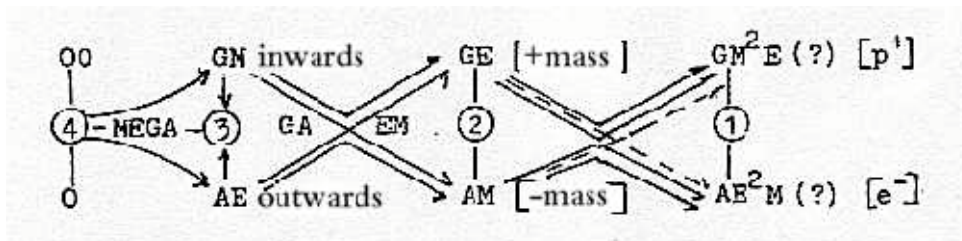# Forces - MEGA-fields

Starting points:

All forces should be connected and possible to deduce from one another, according to the dimension model but also assumed by many physicists.

Still, there doesn't seem to be much of that connections in the latest standard model, more comments here.

Outsiders are perhaps too inclined to believe the physicists' interpretations of the day, much of which is speculations within a given framework A certain scepticism could sometimes be relevant as for instance towards economists of the day.

MEGA-fields - as a suggestion:

Adopting fully the Big Bang theory, in a more fundamental way than many physicists, starting with a point in this model, we could presume a 4-dimensional vector field as a preliminary stage out of which force components of gravitation and electromagnetism, those which the physicists have defined, are developed. As a suggestion here called MEGA-fields:

A for Acceleration (outwards), F_A
G for Gravitation (inwards), F_G
E for Electric field component, F_E
M for Magnetic field component, F_M

Out of this MEGA-field the forces should crystallise through polarisations, partial crossing over (pole exchanges) and combining in later steps, emerging into complex polarities towards lower d-degrees - and composed of each other.

The polarity 0 --00, centre---anti-centre, outward direction --- inward direction, could first apply to the components
A,E <====> G, M:
G-M as 00-forces, A-E as 0-forces.
(Note that we here will regard F_E and F_M as separate forces.)

Note:
It´s said also (by Hoyle) that gravitation and the electro-magnetic force seems to have been equally strong in a universe with 1 particle (interpreted as one mass unit or as the entire Mass?).

Adding here:
When Kulaza after Einstein tried equations for a 4-dimensional space and got one extra equation very similar to Maxwells' for the electromagnetic force, it seems to agree with the suggestion here. One could perhaps talk about "meta-volumes". Illustrations of 4-dimensional cubes for example (in a book from the 1960th) give the form of a hollow cube inwards, as built-in into a 3- dimensional one. Compare the string theory.

(One aspect could eventually be a gradual branching off through angle steps - but hardly as in this figure from the original with G first:
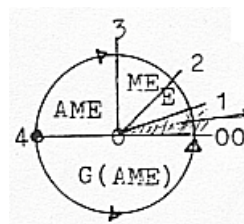
With the other two forces that physicists recognise as such, the nuclear force or "strong interaction", Fst, and the the "weak interaction", Fw, the original suggestion here looks like this:
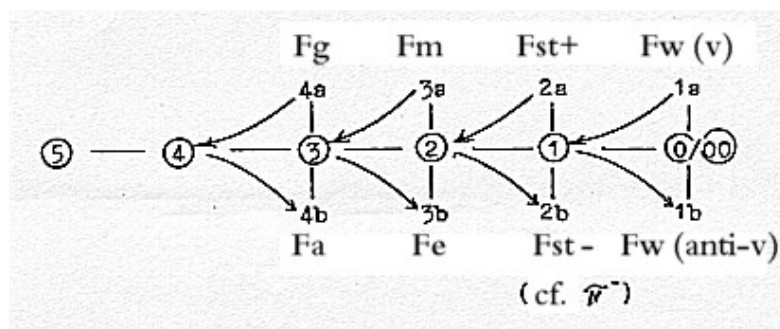
(W- and Z-bosons not identified in the 70th. Fw, Fst have now new interpretations in the standard mode, see discussions.)

F_A, the outward acceleration force:
According to the model here all forces should show up in complementary forms.

F_A, an acceleration force, is not identified as a special force by physicians, but which force should else be responsible for the Big Band?! (Now, in later days, the view is accepted that Universe expands, and one talks about "vacuum energy", more here.) Radial acceleration and gravitation is counterdirected vectors as complementary forces out of outward / inward direction.
    In this meaning Acceleration can be seen as "anti-gravitation" and the force responsible for the expansion of Universe (and its negative radii of curvature? About negative curvature, se the booklet "Astronomy" of this series. Einstein noticed gravitation as an answer to acceleration, but did only see the latter as a mechanical force created by human beings?)

3(13)

Gravitation could be seen as the answer to this expansion of Universe. Acceleration and Gravitation out of 0- and 00-poles as "meta-forces".

That gravitation must have a counterforce is reasonably obvious - what should else maintain the separation of celestial masses?

We can compare with longitudinal waves of concentrations and thinnings which mutually presuppose one another, of motion directions towards and from one another:
$$\longrightarrow | \longleftarrow, \longleftarrow | \longrightarrow .$$

Gravitation collapses seem to be followed by an increase in the centrifugal force with energy transportation outwards, - as an interaction between complementary vectors. (According to the fundamental hypotheses in the dimension model we also have that converging movements define a new 0-pole - for a secondary 4-dimensional vector field with primarily outward direction, and that diverging movements define a new 00-pole, giving inward direction.)

G - EM - connected with physical qualities - and Fst ?:
That gravitation is coupled with <u>Mass</u> and the electromagnetic force to the relation between opposite <u>Charges</u> is out of question.
We can assume:
- Mass and Vacant Space as transformations of G-A-fields in
d-degree step 4→3, or 4 ← 3,
- Charges as p+ and e- as transformations of E-M-fields in d-degree step 3→2, or 3← 2..

Compare that EM-waves (photons) can transform to electron-positron pairs in the neighbourhood of heavier masses, interpreted here as in inward direction.

But how on earth could strong interaction, **Fst**, be connected with the entity Distance, or in the step 2 - 1 related Charges and Distances (1-dimensional potentials) as suggested here?

Two things are evident:
Gravitational gathering of big masses, leading to high pressure and high temperature in stars is also needed for fusion and the development of a nuclear farce - conquering Distance!.

And the nuclear force cannot develop before the polarisation of the property Charge into (+) and (-). In this aspect a later step in relation to the electromagnetic force **Fem.**

Fst seems to be more of a superposition of elements in the earlier to forces, G and EM, a result of the differentiation of potentials in these earlier forces into perhaps 2-1-dimensional ones. This view is also in agreement with how physicists tentatively described the force some decades ago.

According to the dimension model here we have that number of motions increases towards lower d-degrees of structure. And physicists have stated that the nuclear force can be analysed in spin-spin- and and spin-path-couplings, that is to say motions.

The particle for communication between protons is the π+-meson:
Compare perhaps the relation between poles 3a <-----2------>3b:
Protons composed of 3 quarks, mesons of 2 quarks!?
More about the strong force in another file.

Adding one more thing about this strong p-p-binding force: The real complementary

force ought to be - not bonds between anti-p-particles - but the molecular, covalent bonds between electrons in a much colder universe, leading to the eminent development of all life processes.

Or should we, more likely, first see the pairing of electrons with opposite spin in the atomic orbitals (connected with the Pauli principle) as the complementary force on an earlier stage. (Nor is this principle identified as a force, but why not.)

Fw, the force of weak interaction, is connected with the neutrino, mostly recognised as (loss of) kinetic energy in disintegrations of particles with mass. So in the disintegration of charged m-leptons. That is two reasons to see this force connected with the last step in the dimension chain of forces. More about the force of weak interaction here.

The reach of the forces:
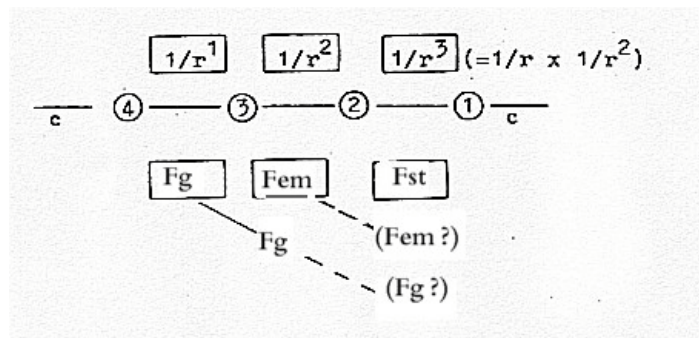
The expressions can be read as a series of derivations à la d-degree steps
$1/r^1$ **F$_G$**- reach for gravitation **within** a mass. Mass as d-degree 3.
$1/r^1$ also valid when masses are accelerated.

$1/r^2$: **FG, Fem** - reach between masses and between charges. Charge, d-degree 2.
When charges are accelerated, there comes to this a term 1/r1, an addition in opposition to the same factor for accelerated masses, which can be interpreted like mathematical integration.

$1/r^3$: **Fst** reach for the strong interaction. The xpression could be interpreted as a product $1/r^1$ x $1/r^2$: strong interaction as a result of factors in previous forces?

G-M-p and A-E-e relationship:
There ought to be a relationship between inward directed components of the forces:
We have **F$_G$**, gravitation, as an inward directed field vector, and **F$_M$**, the magnetic factor in the electromagnetic force, which in many respects has a circular character, representing the anti-centre pole (the 00-pole) in lower d-degree, in relation to the radial electric one.

Physicists have looked for a magnetic "monopole" (not yet found?) and estimated that it should have a mass circa 137 times the electron's. This indicates that magnetic fields can be associated with the property Mass, as Gravitation - in spite of being seen as rather unreal, that is belonging to "vacant space".

G-waves and M-radiation, a note:
Gravitation waves have been difficult to detect. They are said or presumed to be virtual and only realised when masses are accelerated. In this aspect too they seem to resemble magnetic radiation witch only is realised by charges in motion. Hence, it seems that the

gravitation field shows up to be the complemetnary pole to an (outward) acceleration force, according to the MEGA-hypothesis here.

We have the similarity between G- and M-fields too that neither the graviton or the "monopole" has been found. (?)

In general terms we could presume the view that anti-centre poles (00-type) as G and M are continuously redefined by the motion of the unities of the centre-poles, the inward direction as answers (to A and E): Lost d-degrees in a d-degree step are translated into motions according to the fundamental hypotheses. Hence, a charge which is set in motion or an accelerated mass will represent (or "reach") the higher d-degree from where they originate. They become then momentarily coupled - through the higher d-degree as underlying level - to their complementary poles, to the "anti-matter" as a "negative" energy of different degrees, that is activating the virtual M-field or G-field.

Assuming the relation G - M, we have in next step **the particles p+ and e-**, protons representing most of the mass (and "inward directed" in the sense of taking the nucleus position)..

In plasma physics there are mathematical relations which show that

$p \sim M^2$, the magnetic factor squared, (~ sign for proportional to)

$e \sim E^2$, the electric factor squared.

This seems to show a dominant heredity from the magnetic force F_M and indirectly coupled with gravitation, F_G.

We could add that the p+-meson, involved in the binding force **Fst** between protons, has got an essential mass, in opposition to the massless photon, carrier of the electromagnetic force. And its mass is 273 x e, that is ca. 2 x 137, the presumed mass of the magnetic monopole.

F_A - which we connect with expanding Vacant Space - (and with "-E=mc^2 ", according to Dirac), should in the same way be most closely related to F_E, the electric factor in he electromagnetic field (radial in relations to the magnetic one), and with the electron with mostly kinetic energy in next step, (as e- is proportional to E^2 in the plasma formulas above).

This in spite of the connection of Dirac's "E= - mc^2 " with positrons and anti-matter.

We should assume that both E- and M-fields, the electric and the magnetic fields, are complex combinations of factors in both the primary G- and A-fields in a new polarised relation: M-fields also related to Vacant Space in their immaterial property, and E-fields with the Mass and G-fields as electrons have positive energy and makes up an essential part of our matter.

Compare one interpretation of the strong force.

Mass, matter and Charges as "inversion" of vector fields:

In other chapters the hypotheses are brought up that Mass, Matter and Charge should be possible to interpret as "inverted" fields, the result of inversion and/or a change of external fields to inward direction, or with factors of negative acceleration and negative velocity respectively. In this dimension model that corresponds to d-degree steps.

Both the complementary "poles" or forces in the d-degree must then take part in this

change. In p-anti-p-annihilations for example, via p-mesons and leptons much of the energy is transformed to electromagnetic radiation.and neutrinos.

Macrocosm - microcosm:
One of the important aspects on dimension chains in this model, is a stepwise building-in of the 00-pole into centres with growing complexity during the development, centres defined as such, as 0-poles. The building in of the surrounding counterpole as inward directed.

So we - obviously - have celestial bodies of Masses built-in into Vacant Space in Macrocosm, and shall find Vacant Space built into mass and matter in Microcosm.

G - EM: dimension degree relations:

G-and E-waves 180°-90°:
Interpreting gravitation according to the dimension model, we should be able to assume that G-waves are longitudinal, in relation to EM-waves as transversal? G-waves à la sound waves:
- Longitudinal waves: 4 -- 1-waves: Out of radial, anti-parallel fields (4), propagation in one (1) dimension, counterdirection 180°.
- Transversal waves: 3 -- 2-waves: Counterdirection E-M 90°.

Some numbers:
About Gravitation and electromagnetic force as connected with Mass and Charge in d-degree 3 and 2 respectively:

Assuming that the cube of the radius of Universe is about 10^{80}, radius then $10^{26,66}$. m (said to be circa 10^{26} and calculate the atom radius as the "Bohr radius" for hydrogen, the quotient will be:

$$\frac{\text{Volume of Universe}}{\text{Sum of volumes of atoms}} = \sqrt{3} \text{ in log-numbers}$$

$$\frac{\text{Volume of atoms (e-shells, negative charrge)}}{\text{Sum of volumes of atomic nuclei (positive charge)}} = \sqrt{2} \quad "$$

Presupposed circa 10^{77} nucleons in Universe (Estimation 1973). The radius of the atom nucleus, given as circa 10^{-15} m, would be $10^{-14,8}$ m.

(Would it be possible, eventually, to conclude the existence of gravitation waves - indirectly - from changes in the magnetic field of the earth for example? G- and M-vectors, according to assumptions here, related to one another.)

About d-degrees of forces;
a. According to clasical physics gravitation ($\mathbf{F_G}$) and the electromagnetic force (**Fem**) becomes 2-dimensional if Mass is interpreted as 3-dimensional, Charge as a 2-dimensional quality and **Time and Distance as 1-dimensional**. These forces could in that case be interpreted as "roots" out of 4-dimensional vector fields or as components in them.

b. However, **if Time is interpreted as a 0-dimensional** entity, F_G, gravitation becomes 4-dimensional and **Fem** 3-dimensional if we as before regard.Charge as a kind of derivative of Mass.

(Velocity could be seen as a 1-dimensional quantity. Primarily interpreted as an expression for a d-degree step, velocity corresponds to the loss of 1 d-degree)

Appearance of the same force in different d-degrees:
If we assume that the force components from a MEGA-field show up restructured in following d-degree steps, it ought to imply that the phenomena which are identified as gravitation or electro-magnetism must be interpreted in different dimension degrees (or steps).

So for instance, it seems that we have to distinguish between revelation forms of gravitation in different d-degrees. They could perhaps be described as follows:
- negative acceleration or anti-parallel acceleration in
  d-degree 4,
- as equivalent with Mass or "inverted" into Mass in
  d-degree 3,
- as an explanation of the motion structure between 2 celestial bodies in d-degree 2,
  with one radial and one tangential acceleration vector perpendicular to one another.

Compare also the hypothesis about <u>Matter and Vacant space</u> on a potentially graded minus-energy: empty space of different quality and degrees of "sweating".

"Carriers" of forces, forces acting over distances:

It has been an old problem - for Einstein and others - how forces can act over distances (as e.g. gravitation). The first natural answer should be that it is "forces" that creates distances. There is nothing like "distance" at first, no such concept.
    The Big Bang of Universe is one example. And ordinary mechanical pushes. Distances too become forces, which for example give birth to road buildings (path ways), which in their turn bring about traffic motions, with cars as "force mediating quanta" or "carriers of forces".
    (The human need that transforms a distance into a road construction is of course an expression for a fundamental binding force.)

Now when we have distances, that is a space and different positions of matter: are there empty distances or the virtual existing of something, of a memory of a bond?

"Carriers" of forces:
What do the physicists mean with "carriers" of forces, with "force mediating particles? Some type of quanta in motion, one-way or return in interaction..
    One speaks about gravitons and photons as wave quanta, or other elementary particles with more or less particle like structure.
    The relation ordinary particles and these quanta of forces can perhaps be imagined as in this figure, as a relation between levels of dimension chains, related to the difference between borders and intervals |---|---|.
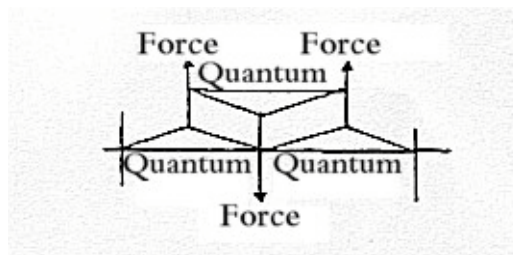
If we assume that levels are "1/2"-step displaced in relation to one another, or displaced a partial step, as border/interval, that which is seen as forces on one level could show up as quanta (with more or less of particle like structure) on another level, and vice versa.

Cf.. the relation coenzyme - substratum in biochemistry? Coenzymes as forces on a biochemical level.

Language can be defined as a force on superposed levels, that is an interaction between human beings. If the content is the force, the words are the quanta of that force, or its "carriers".

At the same time the air as medium for the sound waves can be called the carrier of the force. The concept becomes ambiguous. The air would represent the "field" concept, quantified in quanta.

What is a "force"?

In ordinary physics we meet a mess of expressions for "forces", forces as only "connections" or mathematical relations, forces as fields, "electromagnetic field", "gravitational field", the force of gravitation as inertia, equivalent with mass, "carriers" of forces as quanta, the same as forces or what?, forces as "waves", gravitation waves, electromagnetic (EM-)waves, forces as "interactions". With the basic definitions in the dimension model here, where "forces" are seen as "relative", as a relation between different dimension degrees, the different expressions for forces become rather easy to understand.

A structure concept for one d-degree becomes a force concept in relation to another d-degree as structure. We can say that fields become binding forces in the mass, in he same manner that translation ways or path lines are binding forces in motion.

Some comments on comparisons with the "standard model":
Physicists' views focus on external relations between particle like quanta, but we shall of course see these motions of communication built in into the structure of more complex unities as atoms and nuclei and galaxies.

We could also adopt the thesis that all the interactions between units use the "negative energy" of Vacant Space for their "implementation". See "Electromagnetic waves".

What about the physicists' statement that all carrriers of forces have integer spin, are so called bosons, in opposition to other, more material quanta with spin 1/2, the so called fermions? Is it possible to get this to agree with the dimension model here?

Not in any easy way. Note that there seems to be to ways to get integer spin, one through being very simple in the structure and one being composed of ½-spin particles which naturalise each others' spin, as the alfa-particle.

And as said before: p and e with spin ½ are"carrier of forces" on the level of biochemistry. See further about the strong and weak force and Spin.

There is also " carriers" both without mass and with heavy mass in the standard model and this without explanation? And two of the four carriers of identified "forces" are not seen, only theoretically assumed.

Example of another problem concerns the graviton; If the photon is the quantum of the electromagnetic force, that is the combination of F_E and F_M, we likewise ought to have a quantum representing the combination of F_A and F_G, a **"ga"-quantum**, not only an expression for gravitation.

Physicists have (earlier) distinguished between polar forces like **Fem**, (and **Fw)** and unpolar, aggregating ones, as gravitation and the strong nuclear force. According to the"dimension model" here there should exist complementary forces in each d-degree (or on each level) and as many polarising forces as binding ones.

Now, in later years, when Vacant Space has been recognised and awarded its own type of energy, we could probably look at the four old "forces" as a kind of conservatism depending on historical heritage. Physicists have also, in more detailed studies, found both attracting and repulsing moments in the electromagnetic "binding force". More about Attraction- Repulsion in another file.

More discussions about forces in the standard model - and critical aspects on this model here.

The 5th force ?
Many, so it seems, have looked for a 5th force. In this model here we cannot aspect that the 5th d-degree, the primary Entirety or unity, should be directly found as a force, as it is unpolarised and all "forces", as one-way directed on some level, will have cancelled out each other.

With the hypotheses in this dimension model, we should see **Motion** (d-degree 0/00), - all the motions of Universe - as the translation and expression for the 5th d-degree, the 5th "force". (Call it Fk, k for kinetic, or Ft, t for temperature.)

Of course Motion too must be seen as a force, not only as the result of forces as in old mechanical physics. Big Bang is one example, ordinary pushes or hits are others.

At the same time we can identify its poles 0 and 00 as the next primary forces: 0-pole (the centre) as the binding force and 00-pole (the anti-centre) as the polarising force. Between these poles are the following lower dimension degrees developed.

We get two aspects on the 5th degree as primary "entirety force" or pair of forces:
- As pair of forces it is binding force relative to lower degrees, as joint "fork of a branch".
- As polarised, the 0-pole becomes the secondary binding force in relation to the 00-pole as secondary polarising force "the other way around".
- Binding character for the 0-pole: integrating from inside.
- First binding character for the 00-pole in 5th degree: aggregating from outside.

Even if the physicists should find a 5th force, that doesn´t mean that it is the 5th one. It seems very dubious too if the definitions of the 4 "primary" forces which the physicists have recognised up till now - and their concept apparatus can be seen as final or conclusive and satisfy the need for a world of inner connections. There is really not much beauty in the "standard model".

Strength and weakness of forces:
Some more general comments in a separate file.

Number of particles in Universe:
The number of particles (nucleons) in Universe was estimated to about 10^{77} according to the physicist in the year 1973. That is to say, about the inversion of the relative strength of the gravitation squared and with negative sign.

$$\frac{Fg}{Fem} \approx 10^{-38,5} \qquad \left[\frac{1}{10^{-38,5}}\right]^2 = \frac{10^{77}}{1}$$

|
~ relative strength   number of nucleons
Fg / Fem in Universe

(Mass of the entire Universe at that time estimated to circa 10^{50} kg. Year 1973.)

Some problems:
It is a bit difficult to see Gravitation as a more high-dimensional force than for instance the strong nuclear force. Both in its weakness and its property of aggregating masses of nuclei.

One aspect is to see the "00-components" of forces as F_G and F_M meeting from the end of a dimension chain, - or to view the lost d-degree in d-degree steps outwards meeting the 0-components of forces (F_A, F_E) "the other way around" from outside inwards:
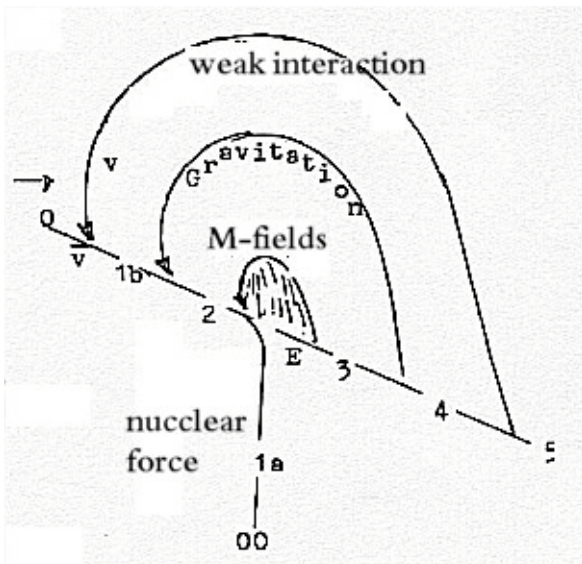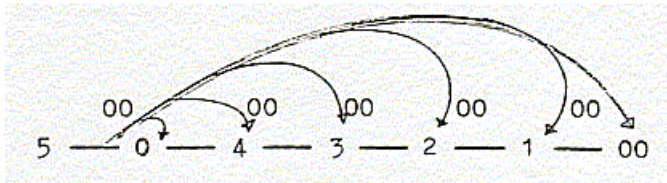

Another question is how for instance the electromagnetic force Fem could be interpreted as keeping up the polarity between the F_G- and the F_A.forces - in agreement with the first postulates that lower d-degrees act polarising on higher ones ? For discussions, see here.

Other sketched illustrations of forces in a dimension chain:
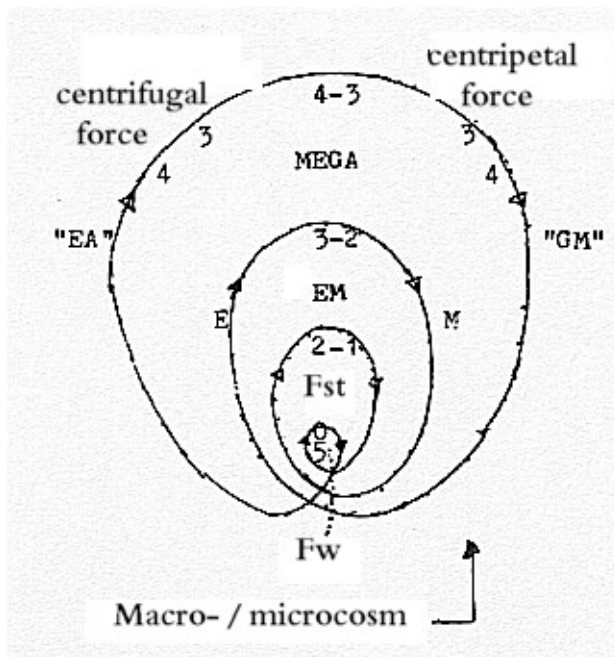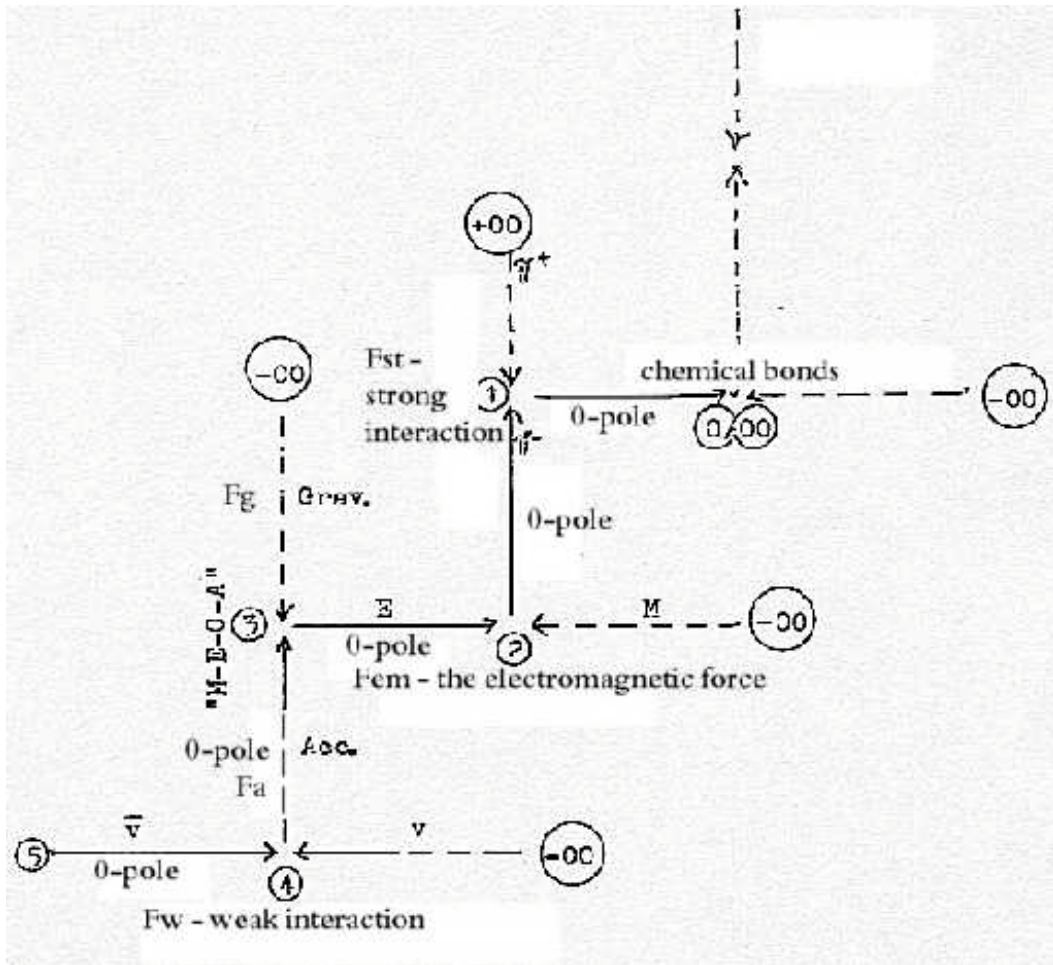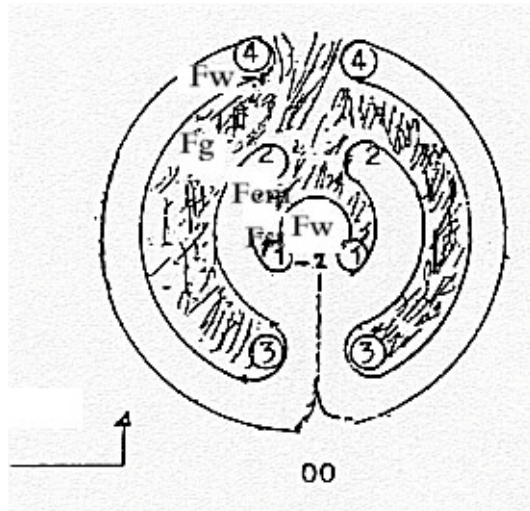
"Polar-unpolar forces as from development inwards"
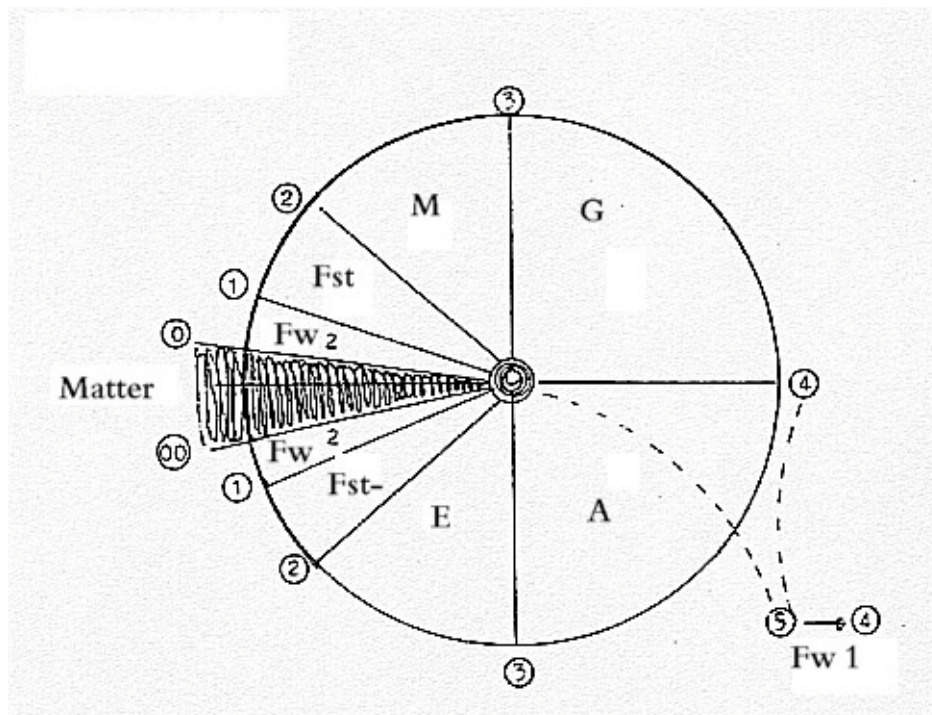
Note: to first figure
"An apple":
Fw as the ramified or forked stalk, Fg as the peel - flesh. Fem as core and Fst as the pips.

Apples and oranges:
For the rest, to pair together the gravitation force with the electromagnetic force seems similar to pairing apples (Newton´s apple) with oranges. Apples with a homogeneous pulp and thin shell, with the segmented oranges in a more liquid and filamentous state - and thicker shell: a polarisation that has gone further, chemically towards lower degrees of "substantiality".

The sun with its convection cells and magnetic sections should perhaps be seen as a hybrid.*