Geomagnetic field reason, magnetic inversions, and extinction of species

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Abstract

Conductive core of Earth is as hot as causing freedom of the valence electrons after which these released electrons distribute themselves toward the core surface and move along with the rotation of Earth causing that magnetic field which forms the big magnet inside Earth. This is a simple account for the geomagnetic field. By accepting this theory we also be leaded to a conclusion justifying the magnetic inversions of Earth based on the existence of several changes in axial rotation of Earth which most probably has had direct influence on expansion of polar ice on one hemisphere and a permanent day on the other hemisphere both causing extinction of species (including dinosaurs). Based on the presented discussions a practical way for direct determination of ionization energies of different elements is proposed.

1 Geomagnetic field reason; A new theory

Why is Earth magnet? So far, the best answer has been searched roughly through the slow flow of matter in the fluid core of Earth

which causes electric current and thereby magnetic field [1-3]. Now, we present a simple and beautiful new theory, instead of the roughly acceptable existent dynamo theory, for justifying the geomagnetic field which is accompanied by proposing some experiments which can test the validity of the theory.

Select a spherical shaped insulator containing a good conductor as its center region. Heat up its center region until the valence electrons of the conductor become almost completely free, ie until the excited thermal fluctuation of the electrons cancel their bond forces to their nuclei. In this state, we have some free electrons which distribute themselves toward the surface. The fixed remaining positive ions cannot neutralize themselves by attracting adjacent valence electrons and distributing the positive charge toward the surface in this manner, because the mentioned fluctuation arising from heat cancels such an attraction. In other words, the same factor causing freedom of the above mentioned electrons from their bond forces, now, prevents them coming back to their initial positions inside the conductor because immediately after such a coming back, this factor, ie the extreme heat, causes again freedom of them from the bond forces to the nuclei.

Regarding the extreme heat of Earth core and its conductivity because of the existence of iron and nickel, we can say that the center region of Earth acts like the center region of our sphere. As we approach the center of Earth, the temperature increases and the matters become more molten, and as the rarefaction of matters increases the matter accompany less the earth in its rotation about its axis. Ideally we can imagine that these central matters do not accompany the earth at all in its rotation about its axis and remain motionless while the freed electrons, distributed onto the outer surface of the core, which nearly accompany the earth in its rotation about itself, revolve around this motionless core. According to the electromagnetic theory and what presented at the section 3 of the paper "Cause of Claimed Breach of Newton's Third Law in Electromagnetism" [16] or in the book "Electromagnetic Theory without the Lorentz Transformations" [14], these revolving electrons around the earth's core make some magnetodynamic field which forms the big magnet in the earth's core that makes magnetostatic field.

Linear velocity of the compasses which are stationary relative to the ground (ie accompany the ground in its revolving around the core)

is a little bigger than the linear velocity of the electrons on the outer surface of the core which are revolving around the core and is almost much bigger than the linear velocity of the positive ions of the core which are nearly motionless. Consequently, concerning the orientation of the effect on the magnetic needle of compass, in total the situation is as if the compass is motionless relative to the stationary core of the earth and the electrons on the outer surface of the core revolve around the earth's axis in the same direction of the rotation of the earth about itself. Consequently in total the magnetodynamic field effective on the stationary compass on the ground is in the same direction of the magnetostatic field of the magnet of the earth's core.

(It seems that in Jupiter, because of the extreme pressure, central matters which contain positive ions are denser although are hotter and then their angular velocity are bigger than one related to the external gaseous matters which contain free electrons and accompany them less. Based on what presented above, this can justify the opposite magnetic direction of this planet.)

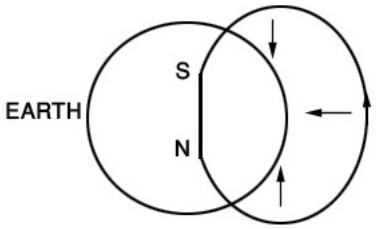
This reasoning proposes another experiment that can test its validity. If, instead of being motionless, a compass is set in fast motion on the ground, it will be oriented not only by the big magnet, but also by changing the mentioned magnetodynamic field; then accepting this theory we expect some difference between the orientation of a motionless compass and a compass in motion, while if the orientation of a compass needle is to be caused only by the magnetostatic force due to the big magnet inside the earth, a motionless compass must be oriented in the same direction as a compass in motion. (It seems that to observe such an effect our compass should be either more sensitive than what the present compasses are or in a very fast motion (probably even more than the speed of the planes). Perhaps observed disorders in compasses of spacecrafts when being launched are because of this effect.)

One can say but the earth magnetic field axis does not coincide exactly with its rotation axis (neither even distinguished sharply [4,1]). Obviously, many minor factors related to the complex interior of the earth or even exterior factors must be considered, eg the magnetic hysteresis of the core or the effect of the magnetic fields of other celestial bodies (eg satellites, planets and Sun). There is also a probable mechanical cause for such a noncoincidence of the magnetic axis and rotation axis: The real state of the molten core of the earth (which

is close to ideal state stated above) is a core consisting of molten layers which as we approach the center of the earth (their rarefaction increases and) their angular velocity decreases and in other words accompany less the solid crust of the earth in the rotation of the earth about itself. In addition to the rotation about its axis, the earth has revolution round the sun and this exerts another rotation on the earth about the axis normal to the surface of the orbit of the earth round the sun passing through the center of the earth which causes the gradual rotation of the tilted axis of rotation of the earth. This another rotation is probably a little different for the above-mentioned molten layers of the core of the earth. Considering this difference and that at last the revolution of these layers is also a function of the revolution of the crust, it seems that the axes of rotation of these layers are not exactly coinciding with the axis of the rotation of the solid part of the earth and even these axes are not constant either. Therefore, in total, the axis of the magnetic field of the earth is not exactly coinciding with the axis of the earth's rotation although is close to it.

2 Other influences of the theory

The free electrons distributed toward the surface of the molten core of the earth might indeed be pushed out to the equatorial region by the action of electrons in the presence of the magnetic field of the earth. In fact the electromagnetic theory predicts that if the free electrons are along the magnetic field line of the earth as shown in the figure, the force exerted on them is inward as shown by relevant arrows in the figure. This means that electrons gather at the equatorial region and this itself helps the produced magnetodynamic field to be more intense.



In a similar way we should expect that the positive ions of the core to tend to gather at the poles of the core sphere in the presence of the geomagnetic field (while neutral atoms of non-ferrous substances of the core replace them at the equator of the core sphere). These suggest that we can ideally consider the distribution of the separated electric charges of the core as a negative ring of the core's equator and two positive poles of the core's geographical poles. Such a distribution has an electrostatic field originating from the earth's poles and ending up the earth's equator. Such a field is more intense at the poles than at the equator. Maybe this electrostatic field can be detectable by proper instruments, eg a sensitive light powerful permanent electrostatic dipole acting similar to a compass, and maybe it has its own effects on aurora borealis and australis.

It is an extreme simplicity to think that the orbit of revolution of the earth about the sun and also its direction of rotation about itself have not been changed during the long life of the earth, since eg it is notable that accurate measurements show some continuous changes in the length of time of one rotation of the earth [4,5]. If we accept existence of several changes in the direction of the earth rotation during its life, we can easily justify the proven inversion [6-10] in the magnetic field of the earth by considering the above-mentioned discussion about the relation between the direction of rotation and the direction of magnetic field. The biggest reason that the possibility of reverse in the rotation direction of the earth existed and will exist is that at present the rotation direction of some of the solar planets is opposite to others.

Anyway, the process of slowing down of the earth rotational speed is not deniable [11,12]. On the other hand, the decrease of the earth

magnetic field strength during the last 100 years has also been proven (and even it is known now that the next change in the earth geomagnetic direction is possible) [4]. And interesting to say that the simultaneity of these two decreasings (of the earth rotational speed and of the earth magnetic field strength) is a decisive evidence to prove the theory.

This theory also necessitates that, as there are some indications [13], the geomagnetic field has been passed through zero when reversing.

It is also possible that the changes in the direction of rotation of the earth have had their mechanical effect on the movement of the plates of the earth's crust.

That in the theory presented in this article the direction of the earth's magnetic field is connected with the direction of the earth's rotation about itself, provides this experimental opportunity for paleontologists, when they are investigating the magnetic direction of ancient sediments, to search out some indications of the (eastern or western) orientation of rising of the sun in them or in other remainder synchronized marks, frozen in them simultaneous with their magnetic orientation. Anyway, it seems that rising of the sun in the east and its setting in the west have some effects on the earth and its ingredients different from effects caused when the sun is to rise in the west and set in the east. As a rule, this difference should be detectable when investigating the remainder effects.

Another important point in this respect is that in the period that Earth has been changing its rotation about its axis, a half of it has been always day and the other half has been always night. (Indeed in such a situation, one rotation of Earth about itself lasted one year.) This fact can be a chief cause for extinction of species on Earth. Indeed we can say that this is alternating of day and night that can be a proper substrate for distributing of species on the ground. Also this can be a reasonable reason for expansion of polar ice in glacial epochs arising from long night of one hemisphere of Earth. This theory suggests a new reason for extinction of dinosaurs which is simply existence of period of permanent day for a hemisphere and a permanent night for the other hemisphere.

It seems that reasonably based on this theory we can search for the periods of extinction of species at the moments of change of Earth's

rotation about its axis, and assume that just at these moments, direction the geomagnetic field has also been changed. Then, after accepting this scenario, we need to compare it with the data we have in the sciences of geology and paleontology. (For example there are scientists against the theory of sudden extinction of dinosaurs, and by presenting some fossil evidences at the border of periods of Mesozoic and Cenozoic infer that the extinction of dinosaurs had been gradual.)

What we presented above as our Earth, is a huge heavy ball that, as progressing (and maybe changing) in revolution about Sun, is alternatively changing its rotation about itself. Period of this changing cannot be ideally constant, because different motions of Earth are certainly under the influence of the existence and various motions of other nearby celestial bodies.

3 Determination of ionization energies

The above-mentioned mechanism by which nature produces the geomagnetic field inspires us to think for a new and perhaps better way to determine the ionization energy of different elements. At present, the first ionization energy of the elements are determined via a method similar to the Franck-Hertz experiment (explained in [15]). Practical determination of the second and higher ionization energies is not possible by this method and at present they are calculated indirectly by study on the spectrum lines.

It seems that what has caused the direct determination of ionization energy to be impracticable has been not only the difficulties to produce such heat enabling the electrons of the atoms to get freed from the atoms, but also the difficulties to detect such a freedom. In other words, when due to extreme heat the electrons have gotten freed from their atoms, how could we understand this freedom of the electrons? If what presented in this article for the cause of the geomagnetic field is true, it seems that we can devise a similar way for detecting separation of the electrons from the atoms when the atoms are such hot to make their electrons free. If we can do this, we will also have proven experimentally the theory presented in this article for the geomagnetic field.

I think focusing local extreme heat on, eg, a disk-like bounded region full of (the gaseous form of) the element under experiment to

such an extent that the electrons of the atoms get freed is possible by our present technology (maybe by lasers, electric discharge, or other manners). If, simultaneous with this, we rotate the disk-like region about its central axis by rotating only the edge of the disk, we should be able to detect production of magnetic field by suitable and sensitive instruments when such a field is being produced due to separation of the electrons because of the extreme heat and their distribution toward the rim of the disk because of their repulsion. The moment we register the presence of a magnetic field is the same moment that separation of the first electrons has occurred and the energy consumed to heat up the atoms should be registered to calculate the first ionization energy. If we increase our heat, we expect to reach a moment to register an abrupt rise in the magnetic field. That should be the moment of separation of the second electrons. In this manner, practical determination of the second and higher ionization energies of different elements should be possible.

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