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INTERPRETATION OF MAXWELL'S WORK BASED ON UNIFIED THEORY OF ENERGY (UNITHE)

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ABSTACT: "Maxwell believed all his life that the electromagnetic field is filled with a medium that has easily definable mechanical qualities". The space model of my new theory of space is based on the non-pondus energy system and supports Maxwell's ideas while rejecting Einstein's ideas of vacuum concerning space. The movement of the pondus system units along a new periodic pathway results in an internal and external magnetic field. The energy of the external magnetic field can be regarded as work capacity, the source of which is the energy inside the magnet. Therefore, the magnet as an excited special material, functions as a catalyst – like in chemistry – of energy conversion and energy transport. In a magnetized state, it does transport but it does not provide work energy. Eventually, the work energy is provided by the aligned non-pondus energy system as an energy source. By completing Maxwell's equations detailed in this study, Maxwell's work can be regarded as complete and perfect. These completions indicate that both magnetic and electric fields possess exciting energy, their sources are represented by dipole energy quanta and that the interacting field of a special excited material can be utilized as a source of energy with work capacity.
Keywords: dipole energy quanta, ether, pulsed directed space, magnetic- electric field, non-pondus energy

1. INTRODUCTION

No naturalistic model has been developed to date to describe what space is filled with. The Unified Theory of Energy (UTE, UNITHE) [1], [2], [3] aims at developing such a space model. Reading the technical literature [4], I was surprised to find that Maxwell had similar ideas concerning space. "Maxwell believed all his life that the electromagnetic field is filled with a medium that has easily definable mechanical qualities.

Table 1. Maxwell's equations

Title	Number	Differential form	Integral form
Gauss' law	I.	$\operatorname{div} \vec{D} = \rho$	$\oint_A \vec{D} \cdot d\vec{A} = \int_V \rho \cdot dV = Q$
Faraday-Lenz- law	II.	$\operatorname{rot} \vec{E} = -\dfrac{\partial \vec{B}}{\partial t}$	$\oint_L \vec{E} \cdot d\vec{l} = -\dfrac{\partial}{\partial t}\int_A \vec{B} \cdot d\vec{A}$
Gauss' law for magnetism	III.	$\operatorname{div} \vec{B} = 0$	$\oint_A \vec{B} \cdot d\vec{A} = 0$
Ampére's circuital law	IV.	$\operatorname{rot} \vec{H} = \vec{J} + \dfrac{\partial \vec{D}}{\partial t}$	$\oint_L \vec{H} \cdot d\vec{l} = \int_A \vec{J} \cdot d\vec{A} + \dfrac{\partial}{\partial t}\int_A \vec{D} \cdot d\vec{A}$
Laws of material-dependent parameters	V.	$\vec{D} = \varepsilon \cdot \vec{E} \quad \vec{B} = \mu \cdot \vec{H} \quad \vec{J} = \sigma \cdot \left(\vec{E} + \vec{E}_b\right)$	

Polarizability is one of the properties that characterises this medium. In Maxwell's interpretation, a displacement vector in a vacuum was also regarded as polarization density. Therefore, displacement current could be explained with the movement of dipole charges. Thus, the theory of "ether" was only disproved by Einstein's theory of relativity criticized significantly" [4]. The space model of my new theory of space (UTE), (UNITHE) is based on the non-mass energy system (called

non-pondus energy system from now on) and supports Maxwell's ideas while rejecting Einstein's ideas of vacuum concerning space!

Table 2. Completion of Maxwell's equations on the basis of unified theory of energy (summary)

Title	Number	Differential form	Integral form
Ampére's law for magnetic fields	VI.	$\operatorname{div} \vec{H}_m = \rho_{mD}$	$\oint_A \vec{H}_m \cdot d\vec{A} = \int_V \rho_{mD} \cdot dV = I_{mD}$
Ampére's law for electric fields	VII.	$\operatorname{div} \vec{E}_v = \rho_{vD}$	$\oint_A \vec{E}_v \cdot d\vec{A} = \int_V \rho_{vD} \cdot dV = U_{vD}$

Laws of material-dependent parameters for electromagnetic fields and excited materials/masses with special system technology

For magnetic fields   VIII. $\vec{B}_m = \mu \cdot \vec{H}_m, I_{mD}, \rho_{mD} \Rightarrow$ based on dipole energy quanta

For electric fields $\vec{D}_v = \varepsilon \cdot \vec{E}_v, U_{vD}, \rho_{vD} \Rightarrow$ based on dipole energy quanta

Excited magnetic fields e.g.: magnets $\vec{B}_m = \mu \cdot (-\vec{H}_m) \Rightarrow$ its field provides source energy (1)

Excited electric fields e.g.: rocks $\vec{D}_v = \varepsilon \cdot (-\vec{E}_v) \Rightarrow$ its field provides source energy (2)

Completion of Lenz's law   IX.   to what extent does the counter effect of connected effects in a functional chain or the counter effect of the examined effect in the examined connection chain influence the observed source. Reactive factor: $0 \le \varepsilon^v \ge 1$

VIII / in pondus (mass-related) energy systems lacking type (1) and (2) $\varepsilon^v = 1$

VIII / in type (1) and (2), excited pondus (excited mass) energy systems $\varepsilon^v_m = 0$

2. COMPLETION OF MAXWELL'S EQUATIONS BASED ON THE UNIFIED THEORY OF ENERGY

Let us begin with an interpretation of magnetic fields. Let us take an open ring magnet. (Figure 1), where the magnetization closed field lines in the magnet are formed as concentric circles of the closed ring. Let us now write Ampére's law for the state following magnetization. In this case, no conductive current or displacement current as interpreted in general appear in the magnet, their values equal zero. Thus, Ampére's law reads as,
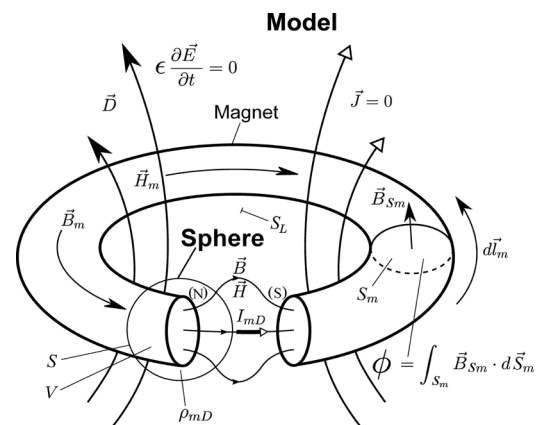
$$\oint_{l_0} \vec{H}_0 \cdot d\vec{l}_0 = 0, \text{ divided } \int_l \vec{H} \cdot d\vec{l} + \int_{l_m} (-\vec{H}_m) \cdot d\vec{l}_m = 0, \text{ furthermore, } l_0 = l + l_m.$$

Where l is the length of lines $\vec{B}$ and $\vec{H}$ closing in the air, outside the open ring, and l_m is the length of lines $\vec{B}_m$ and $\vec{H}_m$ closing inside the magnet. Assuming that the air is free of particles, i.e. ideal gas, $\vec{B} = \mu_0 \cdot \vec{H}$. Where μ_0 denotes the permeability of non-pondus energy system (new concept [1], [2], [3], supporting Higgs' ideas as well, but is not identical with the Higgs bozon theory), in other words, μ_0 is, the conductivity of the field lines, i.e. their conductive field. Maxwell would have been surprised if his ideas and the "ether" had been rejected during his life, since he could only imagine his equations as naturalistic descriptions with the ether in the background. However, his equations were used by Einstein and have been used to date and they are regarded as scientifically accepted. Naturally, the question arises, how space could be conductive if it was a vacuum, which has no mass or

Figure 1. Excited internal and external field strength and induction of an open-ring magnet

energy. (This remark applies to ε_0 as well). The writer of this study also supports Maxwell's ideas. So, on the basis of the Unified Theory of Energy (UNITHE), [1], [2], [3] the periodically operating systems or parts of a specially alloyed ferromagnetic material shift to another periodic pathway in the process of magnetization, which – due to the special alloy – is a stable state and persists even after magnetization is over.

The movement of the pondus system units along a new periodic pathway results in an internal and external magnetic field. In reality, this observed directed space is a pulsed directed space (new concept [1], [2], [3]), which brings about gravity, and whose mean value – following the magnetic

impulse – is displaced by a scalar value characterizing the (N)-(S) magnetic poles (see Figure 1) This can be written as a magnetic scalar potential and it results in an increase in internal energy inside the material. The power system of the new pathway's wave field contact results in an increase in the internal voltage of the material until the magnetic material gets demagnetized. As a result of this increase in internal energy, the non-pondus energy field, which features equal energy density, gets aligned and directed. The directedness of the non-pondus energy system inside the magnet is denoted by induction $\vec{B}_m$ and the external alignment, directed field (new concept [1], [2], [3]) counterbalancing it is denoted by induction $\vec{B}$. The directed field of these inductions result in a closed chain of aligned dipole energy quanta (new concept [1], [2], [3]), which are generally known as field lines. The internal aligned field of the magnet is ensured by the source field strength $(-\vec{H}_m)$ The sign (−) indicates that the work of excitement creates an internal directed field, i.e. the operation of the material along a new stable pathway, and consequently, the directedness of the non-pondus energy system, thus ensuring an internal magnetic field. The external field strength $\vec{H}$ counter-balances this source field strength $(-\vec{H}_m)$, the identical value of the former is ensured by the non-pondus energy system with infinite degree of freedom (in practice, this is also justified by the fact that an industrial magnet in a magnetized state, can be regarded as air in terms of volume flux conduction). As a consequence of this control, the internal energy of the magnet equals the energy of the external magnetic field, which is in equilibrium with it (Figure 1). Thus, the internal and external energies can be represented as,

$$E_m = \int_{V_m} (-\vec{H}_m) \cdot \vec{B}_m \cdot dV_m = \int_V \vec{H} \cdot \vec{B} \cdot dV = E_W .$$

The energy of the external magnetic field E_W can be regarded as work capacity, the source of which is the energy inside the magnet E_m. Therefore, the magnet as an excited special material, functions as a catalyst – like in chemistry – of energy conversion and energy transport. In a magnetized state, it does transport but it does not provide work energy. Eventually, the work energy E_W is provided by the aligned non-pondus energy system as an energy source. With recognition of all this, Maxwell's equations are completed – on the basis of the new space model – with the non-pondus energy system (new concept [1], [2], [3]), which is based on the dipole energy quanta. A sphere with a closed surface S and volume V as drawn around the ring magnet's poles in Figure 1, will be examined. Field strength $\vec{H}_m$ is multiplied by the area of surface S, the multiplier value of 1, which is mathematically accepted and practically chosen,

$$\vec{H}_m \cdot \frac{S}{S} = \frac{\vec{H}_m \cdot S}{S} = \left(\frac{\vec{H}_m^*}{S}\right) = \frac{\left[\frac{A}{m}\right] \cdot [m^2]}{[m^2]} = \frac{[A \cdot m]}{[m^2]} = \left(\frac{[A]}{[m]}\right).$$

The designation of the initial field strength $\vec{H}_m$ – as interpreted according to the above relationship – remains unchanged, so designation $\vec{H}_m^*$ is omitted, since $\vec{H}_m$ also keeps its original value as a result of being multiplied by 1. The equations below can be written for the closed sphere surface and volume (Figure 1) since on the basis of what we have seen, $|\vec{H}_m| = |\vec{H}|$ is realised and H_m can be written inside the sphere instead of H, with the dimensions being interpreted in the form of $\vec{H}_m\left[\frac{A \cdot m}{m^2}\right]$ and $\rho_{mD}\left[\frac{A \cdot m}{m^3}\right]$. Applying Gauss' law with this recognition, we get

$$\oint_S \vec{H}_m \cdot d\vec{S} = \int_V \text{div}\,\vec{H}_m \cdot dV = \int_V \rho_{mD} \cdot dV = I_{mD} \text{ and } \text{div}\,\vec{H}_m = \rho_{mD}.$$

As it can be seen, $\vec{H}_m$ field strength has exciting energy, and its sources are the aligned dipole energy quanta. The quantities in the relationship, according to the applied dimensions are: $\vec{H}_m\left[\frac{A \cdot m}{m^2}\right]$ is the magnetic dipole current passing through a unit surface. $\rho_{mD}\left[\frac{A \cdot m}{m^3}\right]$ is the dipole density of the volume, i.e. the amount of aligned dipole energy quanta in the unit volume. $I_{mD}\left[A \cdot m\right]$ is the magnetic dipole current in the length, which appears as a source energy and

functions as a generator! Next, let us examine electric fields in an arrangement model applied for magnetic fields. Electric fields are examined according to the model shown in Figure 2. According to Maxwell's Equation II, a closed conductive ring has an induced voltage U_i, while the induced voltage of an open conductive ring can be defined – with calculation approach – as,

$$U_i = \oint_L \vec{E}_i \cdot d\vec{l} = -\frac{\partial}{\partial t} \int_{S_L} \vec{B} \cdot d\vec{S}_L \cong \int_-^+ \vec{E}_S \cdot d\vec{l} = U_S.$$

Where the values applied are interpreted according to the technical literature. With considerations of Maxwell's Equation I, the following equations can be written for a sphere with surface S and volume V as seen in Figure 2,

$$\oint_S \vec{D}_i \cdot d\vec{S} = \int_V \operatorname{div} \vec{D}_i \cdot dV = \int_V \rho_i \cdot dV = Q_i \quad \text{and} \quad \operatorname{div} \vec{D}_i = \rho_i.$$
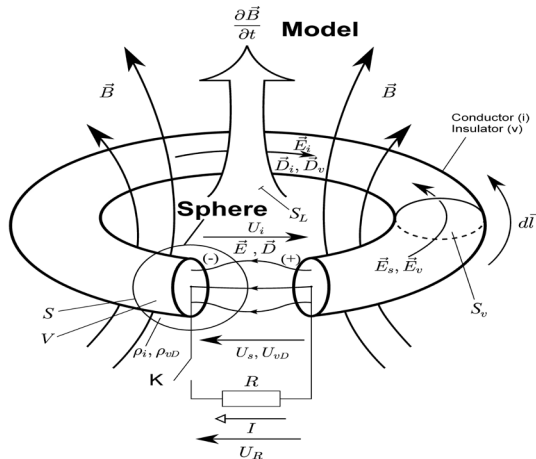

Figure 2. Excited external and internal electric field and load of an open-ring conductor and insulator

It can be seen that the source of the electric field in the examined volume is represented by the charges Q_i brought about by the induction change $\frac{\partial \vec{B}}{\partial t}$ therein.

If the switch denoted K, in Figure 2, is closed, the conduction current I starts to move and does work on resistance R generating heat. Current I around the conductor generates induction $\vec{B}_I$, in return reducing induction $\vec{B}$, having generated $\vec{B}_I$. Let us suppose that $\vec{B}$ is sinusoidal in time, supplied by the excitation current I_{1g} of a sinusoidal voltage source U_1 with constant amplitude that is connected to another conductor ring in accordance with the construction of a transformer. Disregarding the usual losses and in accordance with the laws of the non-pondus energy system, striving for an energy balance and energy minimum, it is naturalistic that current I_{1g} is increased by the decrease value I, so that the displacement current, i.e. U_S should remain constant. As it is typical of electric machines, for one turn the following equations can be written, applying complex vectors and still disregarding losses,

$$\overline{\phi}(t) = \int_0^t \overline{U}_1(t) \cdot dt = L_1 \cdot \overline{I}_{1g}(t) \; [Vs].$$

The equations shown must prevail at every moment in time! Consequently, supposing that U_1 is constant, nature's minimum total potential energy principle strives for constant values for ϕ and thus I_{1g}. As a result of this control process, the energy consumed by the resistor is supplied from voltage source U_1 characterized by constant amplitude as a result of the control of the non-pondus energy system. Consequently, the amount of work performed by nature in the course of energy transfer equals the amount of work the resistor R needs, i.e. the amount of space defect caused by current I, thus ensuring energy conservation. Therefore, the non-pondus energy system functions as an energy source with work capacity, ensuring the principle of energy conservation, thus its existence is essential and cannot be disregarded! Let us examine the case according to Figure 2, where $\frac{\partial \vec{B}}{\partial t} = 0$ and the illustrated electric circuit of resistor R is omitted (e.g.: switch K is open).

Beginning with the external electric field, it can be stated that,

$$\oint_{l_0} \vec{E}_0 \cdot d\vec{l}_0 = 0, \quad \int_{l^+}^{l^-} \vec{E} \cdot d\vec{l} + \int_{l^-}^{l^+} (-\vec{E}_v) \cdot d\vec{l}_v = 0.$$

When can the above equations be interpreted? Naturally, only if source field strength $\vec{E}_v$ is somehow generated and it will naturally be the reverse of field strength $\vec{E}$. Let us examine a special

alloy to the analogy of the magnet, e.g.: a rock or a pebble with special components. Suppose it is electrically excited, e.g.: by a field generated by a lightning strike. If $\vec{E}_v$ generated as a result of the exciting impulse persists even after the impulse ends, by shifting the periodically moving systems of the material to another periodical pathway, then this $\vec{E}_v$ represents a source energy. Just like $\vec{H}_m$ in a magnet. In nature, for example, a pebble with special components can illustrate how a ball lightning is generated and work. The work capacity of a pebble's external field $\vec{E}$ equals the internal energy of the excited pebble, i.e. the energy of the aligned dipole energy quanta E_{vk}. It can be written as,

$$E_{vk} = \int_{V_v} (-\vec{E}_v) \cdot \vec{D}_v \cdot dV_v = \int_V \vec{E} \cdot \vec{D} \cdot dV = E_W .$$

It can be seen when a material with special components is electrically excited, the non-pondus energy system is used as energy source, like in the case of magnets. Based on the new space theory, and following the way magnetic systems were examined, let us examine once again the electric field of a material system that remains in a stable excited state due to excitation by an electric impulse with special system technology. The characterizing electric quantities are represented in Figure 2, where the external exciting fields have ceased, resistor R is disregarded and an insulator is applied instead of a conductor. Hence, to the analogy of generating magnetic fields, Ampére's law can be written to describe an electric field after electric excitation as,

$$\oint_{l_0} \vec{E}_0 \cdot d\vec{l}_0 = 0, \text{ divided } \int_l \vec{E} \cdot d\vec{l} + \int_{l_v} (-\vec{E}_v) \cdot d\vec{l}_v = 0, \text{ furthermore } l_0 = l + l_v .$$

Where l is the length of lines $\vec{D}$ and $\vec{E}$ closing in the air outside the open ring and l_v represents the length of lines $\vec{D}_v$ and $\vec{E}_v$ closing inside the material. Assuming that the air is free of particles, i.e. ideal gas, then $\vec{D} = \varepsilon_0 \cdot \vec{E}$, where ε_0 denotes the permittivity of the non-pondus energy system, i.e. the conductivity of displacement lines. Next, a sphere with a closed surface S and volume V as drawn around the open ring excited material's electric poles in Figure 2, will be examined. Field strength $\vec{E}_v$ is multiplied by the area of surface S, the multiplier value of 1, which is mathematically accepted and practically chosen,

$$\vec{E}_v \cdot \frac{S}{S} = \frac{\vec{E}_v \cdot S}{S} = \left(\frac{\vec{E}_v^*}{S} \right) = \frac{\left[\frac{V}{m} \right] \cdot [m^2]}{[m^2]} = \frac{[V \cdot m]}{[m^2]} = \left(\frac{[V]}{[m]} \right) .$$

The designation of initial field strength $\vec{E}_v$ – as interpreted according to the above relationship – remains unchanged, so designation $\vec{E}_v^*$ is omitted, since $\vec{E}_v$ also keeps its original value as a result of being multiplied by 1. The equations below can be written for the closed sphere surface and volume since on the basis of what we have seen, $|\vec{E}_v| = |\vec{E}|$ is realised and E_v can be written inside the sphere instead of E, with the dimensions being interpreted in the form of $\vec{E}_v \left[\frac{V \cdot m}{m^2} \right]$ and $\rho_{vD} \left[\frac{V \cdot m}{m^3} \right]$. Applying Gauss' law with this recognition, we get,

$$\oint_S \vec{E}_v \cdot d\vec{S} = \int_V \text{div } \vec{E}_v \cdot dV = \int_V \rho_{vD} \cdot dV = U_{vD} \text{ and } \text{div } \vec{E}_v = \rho_{vD} .$$

As it can be seen, $\vec{E}_v$ field strength has exciting energy, and its sources are the aligned dipole energy quanta. The quantities in the relationship, according to the applied dimensions are: $\vec{E}_v \left[\frac{V \cdot m}{m^2} \right]$ is the electric dipole potential of a unit surface. $\rho_{vD} \left[\frac{V \cdot m}{m^3} \right]$ is the dipole density of the volume, i.e. the amount of aligned dipole energy quanta in the unit volume. $U_{vD} [V \cdot m]$ is the electric dipole

potential in the length. Furthermore, it can be stated that by introducing the non-pondus energy system, the micro and macro systems quantize with each other and the system technology of their controlled periodical movements, together with their perpetual motion can also be explained.

3. SUMMARY

With the above recognitions, it can be stated that Einstein's theory of relativity has scientifically justified some unnaturalistic ideas since it can give an accurate, scientific mathematical description of canonical models. Maxwell's idea of the 'ether', however is naturalistic and in perfect harmony with the space model of the Unified Theory of Energy. By completing Maxwell's equations detailed in this study, Maxwell's work can be regarded as complete and perfect. These completions indicate that both magnetic and electric fields possess exciting energy, their sources are represented by dipole energy quanta and that the interacting field of a special excited material can be utilized as a source of energy with work capacity. On the basis of my 34-year research work I see that the new space theory and the new space model can explain well-known physical phenomena in a naturalistic way. The following conclusions can be drawn: the theory of relativity proves to be irrefutable on the basis of the existing scientific principles! The new Unified Theory of Energy also proves to be irrefutable on the basis of the new principles! But, while the theory of relativity cannot interpret the most basic physical phenomena, the new Unified Theory of Energy can! Therefore, the theory of relativity should be adjusted to nature. The Unified Theory of Energy is naturalistic!

References

[1.] Fekete, G.: The New Unified Theory of Energy (UNITHE) and Practically Useful Results, 12th International Conference on Energetics – Electrical Engineering, ENELKO 2011, Cluj, 6-9 October 2011, Proceedings, pp: 28-37. http://www.uni-miskolc.hu/~elkfegab/ENELKO_2011.pdf

[2.] Fekete, G.: A CERN méréseit igazoló új egységes energia elmélet (UNITHE) és hasznosítása az energia átalakításokban, 2012. http://www.uni-miskolc.hu/~elkfegab/ENELKO_2011_kiegeszitett_%282012%29_HUN.pdf

[3.] Fekete, G.: The new unified theory of energy (UNITHE) supporting CERN measurements and its utilization in energy transformations, 2012, http://www.uni-miskolc.hu/~elkfegab/ENELKO_2011_complemented_%282012%29_ENG.pdf

[4.] Zombory, L., Elektromágneses Terek, Hungarian edition Műszaki Könyvkiadó Kft., 2006. http://www.electro.uni-miskolc.hu/elektromagneses_uj.pdf, a feltöltés ellenőrizve 2015. 01. 03.

[5.] Fekete, G.: The new unified theory of energy (unithe) supporting CERN measurements and its utilization in energy transformations, ACTA TECHNICA CORVINIENSIS – BULLETIN OF ENGINEERING 7 : (3) pp. 165-175. (2014).

[6.] Fekete, G. : Energy rectifier based on continuous mechanic filter. International Computer Science Conference, University of Miskolc, 2010, (microCAD `2010), Vol. Electrotechnics and Electronics, pp: 35-40.

[7.] Fekete, G.: New Process of Energy Conversion by Rectifying of Contact Energy. International Computer Science Conference, University of Miskolc, 2007, (microCAD `2007), Vol. Electrotechnics and Electronics, pp: 23-28.

[8.] Fekete, G.: Study of Transfer of Contact Energy of Industrial Magnets in a New Magnetic Power Machine. 16th International Conference on Electrical Machines, ICEM 2004, Cracow - Poland, 2004. Proceedings, pp: 503-504, Full paper, CD-ROM.

[9.] Fekete, G.: A New Energy Based Current Controlled CSI-fed Induction Motor Drive. 11th International Symposium on Power Electronics, Ee 2001. Novi Sad, Yugoslavia, 2001. Proceedings, pp: 216-220.

[10.] Fekete, G.: A New Energy Controlled Current Source Inverter Fed Induction Motor Drive. 9th International Conference and Exhibition on Power Electronics and Motion Control, EPE-PEMC 2000, Kosice, Slovak Republic, 2000. Proceedings, Vol. 7. , pp: 130-134.