Smulsky,J.J. 1992. "When Obstacles are Removed", Apeiron, No. 14, pp. 12 - 14.

References

Bailey, J. *et al.*, 1977. *Nature* 268, 301.

Brace, D.B. 1904. *Phil. Mag.* 6, 317.

Graneau, P., 1985. *Ampère-Neumann Electrodynamics of Metals*, Nonantum, MA: Hadronic Press.

Helmholtz, H., 1872. *Phil. Mag.* xliv, 530.

Hertz, H.R. 1962. *Electric Waves*, NY: Dover (Teubner, Leipzig, 1892).

Jackson, J.D., 1965. *Classical Electrodynamics*, NY: Wiley, p. 381.

O'Rahilly, A., 1965. *Electromagnetic Theory, A Critical Examination of Fundamentals*, NY: Dover.

Phipps, T.E. Jr., 1987. *Heretical Verities: Mathematical Themes in Physical Description*, Urbana, IL: Classic Non-fiction Library.

Phipps, T.E. Jr., 1989a. "Consistency Test of an Alternative Kinematics," *Phys. Essays* 2, 380.

Phipps, T.E. Jr., 1989b. "Superluminal Velocities: Evidence for a New Kinematics?," *Phys. Essays* 2, 180.

Phipps, T.E. Jr., 1991. "Stellar Aberration from the Standpoint of the Radiation Convection Hypothesis," *Phys. Essays* 4, 368.

Phipps, T.E. Jr., 1974. "Kinematics of a 'Rigid' Rotor," *Lett. al Nuovo Cimento* 9, 467.

Phipps, T.E. Jr., 1990. "Toward Modernization of Weber's Force Law," *Phys. Essays* 3, 414.

Sherwin, C.W., 1987. "New experimental test of Lorentz's theory of relativity," *Phys. Rev.* A 35, 3650.

Trouton, F.T. and Rankine, A.O., 1908. *Proc. Roy. Soc.* 80, 420.

Wesley, J.P., 1990. *Found. Phys. Lett.* 3, 443.

Whittaker, E.T., 1960. *A History of the Theories of Aether and Electricity*, NY: Harper, Vol. 1.

Wood, A.B., Tomlinson, G.A. and Essen, L., 1937. *Proc. Roy. Soc.* 158, 606.

When the Obstacles are Removed

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We note with delight that *glasnost* and pluralism of opinions have become current in social life as well as in science. In his article "The Main Brake on Science", Peschevitsky (1989) showed that the path chosen by relativity theory was not the only one. and Cheshev (1989) came to the conclusion that it is necessary to reject this path. Research into an electrodynamics lacking the contradictions of the Einstein-Lorentz theory is already underway. Guided by these considerations, we will consider a variant of electrodynamics based on forces depending on both distance and velocity.

Special Relativity Theory (SRT) consists of an amalgam of physics, philosophy, mathematics and methodology that has been so confused by Einstein's predecessors and followers that it appears as an impenetrable heap of tangled chain. Of course this chain has two ends—the relativity principle at one end, and the limit velocity principle at the other. Since Cheshev (1989) has shown how erroneous ideas of the laws of relativity have been formed for non-isolated systems, I shall dwell on some issues of the use of the relativity principle in relativistic electrodynamics.

If you have a set of charged, magnetized bodies (or conductors with currents), then their effect on a fixed test charged solid or magnet (or a conductor with current) should be described by two of Maxwell's equations. In the event the test bodies move with constant velocity relative to the whole, the forces on these test bodies at the same point of space will be different. Why is this? Many experiments support this fact. A motionless charged body affects another charged body, but does not affect a magnet or circuit with a current. A moving charged body, as shown in the experiments of Roland, Avenvald and Roentgen, will affect another charged body. In electrodynamics, it is assumed that moving charges produce magnetic fields. Yet a fixed magnet or conductor with current does not affect a charged body. When there is relative motion, however, there will be an effect. In electrodynamics, this is interpreted as the generation of electric fields by a moving magnet. This phenomenon is generalized in Faraday's law of electromagnetic induction.

These two groups of experiments (magnetic effects caused by motion of a charged body and electrical effects caused by a moving magnet) are summarized in Maxwell's 1st and 2nd laws. Since the relative velocities of charges and magnets are included in these laws, they differ from Maxwell's equations for the so-called "fixed" case. Thus, the forces on a moving test charge or magnet are different from the forces in the fixed case. Yet, following the relativity principle, in SRT it is assumed that effect must be described by Maxwell's equations in both the fixed case and the moving case. In order to make incompatible equations compatible, the parameters of the equations had to be transformed from the fixed case to the moving case. The parameters of the equations are the tension of the electric and magnetic fields, charge density, distance, time and velocity, and they are transformed by the Lorentz transformation. Consequently, if we consider that the effects in the moving case must be described with similar expressions, the parameters in the fixed case must be expressed with parameters for the moving case. The method is permissible if we bear in mind its relative character. But it is made absolute in SRT, where it is supposed that distance, time, etc. change virtually when transferred from the fixed case to the moving case.

In the Lorentz transformations, the velocity of propagation of electromagnetism is assumed equal to the velocity of light. Since the transformation becomes meaningless when the velocity approaches the velocity of light. it is assumed in SRT that light velocity is a limit. However, since the Lorentz transformations are a convention of mathematical method, the velocity limit is also a convention. If we reject these two principles, we can rewrite electrodynamics as follows.

The set of charges and currents affect moving experimental charges and magnets differently. In the moving case, the Maxwell equations described the effect in a differential way. When we solve the equations (Smulsky 1988a), we obtain expressions for the forces on a moving charge or magnet (Smulsky 1988b). For example, for stationary point charges, the interaction force is determined by Coulomb's law, and it depends on the distance between the points. The expression we have obtained is for the force if there is relative motion between the charges, and it depends on both the distance and relative velocity. At zero velocity it coincides with the Coulomb law, and as the velocity increases, the quantity of force decreases, such that at the velocity of light it is zero. This feature of the solutions explains the decreasing charge-to-mass ratio in the Kauffmann experiments. The calculations are done with the Coulomb law, which is true for fixed charges. If the calculations are done with the new expressions the ratio of charge to mass remains constant.

Therefore, the new solutions explain the known experiments. At low velocity they coincide with the expression for the fixed case, but when the velocity approaches the velocity of light, the solutions yield forces that approach zero. Physically, this is all clear. If the velocity of a moving particle is approximately the velocity of the propagation of the effect, the force affecting the particle must tend toward zero. Naturally, in our approach, length, time and mass do not depend on motion, and remain unchanged.

The new solutions open up many possibilities. In contrast to the approximate method of SRT, the ratios are exact solutions of the equations of electrodynamics. They enable us to calculate complicated effects in more detail. In work done between 1970 and 1972 (Smulsky 1988a,b), we showed that this approach properly describes the phenomena of the electrodynamics of moving bodies, including the Doppler effect and light aberration. Moreover, in 1919, Kasterin and Shaposhnikov showed that for electron velocities approximating the speed of light, the SRT results do not agree with the Bücherer experiment. The solutions we have obtained do correctly describe the results of the experiment.

The realization that electromagnetic forces depend on velocity leads us to unexpected conclusions for all of physics. If forces depend on velocity, then we know from mechanics that the laws of conservation of total kinetic and potential energy are incorrect. This fact may lead to fundamental new results in nuclear physics and elementary particle physics. At the same time, we showed (Smulsky 1988b) that there are other conservation integrals for electromagnetic forces, the use of which will widen the sphere of problems solved in electrodynamics.

The relativity principle and counting system at the root of SRT have given rise to intractable problems, such as the problem of the earth's motion relative to the ether, which must have certain properties. The answer to this question is simple. If a material system is subject to certain effects, its motion can be determined by these effects. If it is not isolated, its motion can be determined. For example, we cannot perceive the motion of a uniformly moving ideal train if the curtains are drawn. But if we let light reflected off surrounding objects into the car, we can determine the velocity of the train with any degree of accuracy. Getting back to the ether, we must first identify its properties in order to isolate its effects and determined the motion of the earth from these.

Since there is no limit velocity, we can find a way to exceed the velocity of light, and superluminal motions must exist in nature. For example, if two accelerators 598 meters apart send particles toward one another with velocities of 2,999,000 *km/sec* each, then in every microsecond each particle will cover 299 meters, and the particles will converge. In other words, the velocity of each particle relative to the other is 598,000 *km/sec*, nearly double the speed of light. It is possible to exceed the velocity of light in relative motion and absolute motion. In 1973, we filed a brief with the State Committee for Inventions on a way to produce superluminal particles.

The General Theory of Relativity owes its origin to the limit velocity principle. The reasoning is as follows: if gravitation exists, it cannot propagate with a velocity greater than the limit velocity. Hence the velocity of gravitation must be equal to the velocity of light. Yet from his analysis of the motion of the moon in 1787, Laplace concluded that if the velocity of gravitation is finite, it must nevertheless be much greater than the velocity of light.

We have shown (Smulsky 1988a) that if the velocity of gravitation is equal to the velocity of light, the usual gravity equations give the same results as the GTR equations for the precession of Mercury's perihelion, the deflection of light in a gravitational field, the slowing down of light emitted by a star and gravitational waves. When a star's radius falls to the gravitational radius, light will stop completely, and a black hole is created. But since there is no reason to believe gravity and light propagate with the same velocity, there is no reason to take these General Relativistic effects seriously. As far as the theory's experimental confirmation is concerned, D. Sciama, a supporter of Relativity, has said that if astronomers did not know the value predicted by GTR, they would never have confirmed it. Furthermore, according to classical mechanics, when a stellar radius decreases (mass being held constant), its escape velocity increases. When a star's radius is equal to the gravitational radius, the velocity becomes equal to the velocity of light (this is how the value of the gravitational radius is determined).

Relativity Theory has created a number of false scents in science, such as the search for gravitational waves, speculations about "black holes" and different Universe models, theories of micro physics, which occupy the time of many scientists. It is now stated that common sense cannot be decisive in science. Violations of common sense and logic in the many paradoxes of Relativity Theory are assumed by many to be an important part of modern theories. We might add one more paradox to the list of Special Relativity paradoxes: the paradox of the negation of the negation.

As we mentioned above, the gravitational field equations of GTR are solved only approximately, and when the velocity is close to the velocity of light, they yield false results. An object moving with the velocity of propagation of gravitation should not experience any effect. As a result, a light beam can neither slow down nor be deflected. The precise solutions I have obtained do yield this result. The GTR effects, such as deflection and slowing of light beams and the notion of a black hole, are the consequences of classical mechanics and Newtonian gravitation theory. For example, it follows from classical theory that light from a body with a radius less than the gravitational radius cannot escape from the body, and it will appear as a "black hole".

For the past two centuries there has been a great craving in mechanics and mathematics for a generalization of methods. The motion and interaction of bodies can be described in terms of force, mass and accelerations, which are the reflections of direct measurement and observation (Smulsky 1988b). However, terms such as energy, Hamiltonians, actions, fields in curved space have been introduced in which the original empirical laws are described in an abstract way. As new generations are taught, the genesis of these notions is often overlooked. Modern physicists also believe that only the notions at the latest level of abstraction constitute external reality, while the measured values are consequences of these notions. The process of thinking takes place only in the sphere of abstraction (a higher level). Theories created by means of logic from these notions succeed one another in a vicious circle from which no escape seems possible. Only someone who realizes that nature is primary and the methods we use to describe it are secondary will find a way out of the vicious circle.

I believe that we are on the threshold of revolutionary changes in physics. The logic of common sense will triumph, and the mystical character will disappear from notions of time and space. Classical mechanics will be restored to its rightful place, and we will achieve a quantum leap in our understanding of the macro- and micro-world. Philosophy and methodology will throw off the chains that have bound them, and all the sciences will reach new knowledge. As soon as the obstacles are removed and non-relativistic work become public property, the process will begin like an avalanche.

References

Cheshev, V., 1989. "Historic Roots of the Brake", *Science in Siberia*, 29.

Peschevitsky, B., 1989. "The Main Brake on Science", *Science in Siberia*, 22.

Smulsky, J. J., 1988a. *On Some Questions of Physics*, Institute of Northern Development, Siberian Branch, USSR Academy of Sciences, Tyumen, 52 pp.

Smulsky, J. J., 1988b. *On Electrical Forces, or a Non-relativistic Description of the Influence of Fastmoving Bodies*, Institute of Northern Development, Siberian Branch, USSR Academy of Sciences, Tyumen, 59 pp.