ESSAY 110: Vector Format of the Evans and JCE Identities

Written by Myron Evans and Narrated by Robert Cheshire,
Translated Into Spanish and Narrated by Alex Hill

The Evans torsion identity of UFT112 and the Jacobi Cartan Evans (JCE) identity of UFT313 are both exact and exactly correct identities of tensorial mathematics and are both entirely new to mathematics and physics. In a rough analogy, they are philosophically akin to the Pythagoras Theorem of Greek classical times. The Pythagoras Theorem is also of course an identity of geometry - two dimensional Euclidean geometry. The Evans and JCE identities on the other hand are identities of a more general and much more powerful type of geometry, one which contains both torsion and curvature. The type of geometry used in the obsolete Einsteinian general relativity used only curvature, and that was just plain wrong. In its time, Einsteinian general relativity was influential but understood by only a very few. Now we have moved on.

Tensorial mathematics are known only to a few specialists in physics, and to mathematicians. They are almost never used in chemistry and engineering. A similar problem of abstraction was encountered by my Civil List predecessor Oliver Heaviside when he translated and simplified Maxwell's quaternionic theory of electromagnetism into the Maxwell Heaviside (MH) theory used in all the textbooks today. The MH theory is always and incorrectly described as "Maxwell's equations", another sign of the lazy minded dogmatic nature of some parts of physics. The real Maxwell equations are completely different and so complicated as to be impractical. It was the genius of Heaviside that made progress possible. It was Heaviside's correspondence with Fitzgerald which very nearly resulted in what is now known as the Lorentz transformation of special relativity.

Heaviside inferred vectors in order to reduce Maxwell's complicated system of about twenty quaternionic equations to four vector equations, together with constitutive relations. I was faced with the same type of task when I inferred the Cartan Evans identity in the early papers of ECE theory. This is the four dimensional Cartan identity used with the relevant Hodge duals. The Cartan and Cartan Evans identities give the field equations of electromagnetism and gravitation as in UFT303 collated by Horst Eckardt, the heavily studied ECE Engineering Model. The field equations are given in vector format, for the electromagnetic, gravitational and the weak and strong nuclear forces.

Similarly, UFT314 translated the Evans torsion identity of UFT112 into vector format, giving a relatively simple result which is already being widely studied only about four or five weeks after posting UFT314. There are various ways of translating the tensor to the vector format. For the first time in scientific history, the three hundred and sixteen papers and books of ECE theory give the necessary complete detail of how to translate differential forms to tensors and to vectors. This is highly non trivial, and without this detail no progress can be made by the non specialist or student. It cannot be left as the proverbial "exercise for the student". That is a lazy way of teaching. I suspect that no student ever does the exercise unless forced to by an examination. The net result is the perpetuation of dogma, and damage to Baconian science.

UFT315 initiated a new era of ECE theory by using the JCE identity together with the Cartan identity. These are respectively the second and first Bianchi identities of 1902 corrected for torsion. Both the JCE and Cartan identities split into two vector equations which will be the subject of considerable development in what I call ECE2, the second era of ECE theory in which the full scope of the geometry is used in the field equations. In both ECE and ECE2 both the torsion and curvature are always non zero, otherwise both electromagnetism and gravitation disappear in generally covariant unified field theory based on geometry - ECE

theory. The difference is that in ECE the potentials and fields were based on the tetrad and torsion respectively, whereas in ECE2 there are additional potential and field equations based respectively on the spin connection and curvature. In ECE2 a new method is used of removing the tangent indices and as shown in UFT316, the net result is a great simplification of the potential and field equations, making them much easier to implement in the physical sciences and engineering. So ECE2 is preferred to ECE by Ockham's Razor.