

APPENDIX FOUR: A BRIEF HISTORY OF THE DEVELOPMENT OF THE $B^{(3)}$ THEORY : THE DEBATE PAPERS

ABSTRACT

The $B^{(3)}$ theory was initiated in Dec. 1991 at the Cornell Theory Center and first published in M.W. Evans, *Physica B*, **182**, 227, 237 (1992). Evans was appointed in 1992 as a tenured full professor of physics in the University of North Carolina at Charlotte (UNCC) for this discovery and the concomitant discovery of an early form of RFR, now routinely used in a slightly modified form by several groups, for example at the Naval Research Laboratory and Harvard (the latter for low field MRI). The theory was debated in a large number of papers which are briefly described in this appendix.

BRIEF HISTORY OF DEBATES

1. The *CPT* and *C* conservation of the *B* Cyclic theorem was debated by L.D. Barron and M.W. Evans in *Physica B*, **190**, 307, 310 (1993). It is now known that Barron is trivially incorrect because gauge theories conserve *C* and *CPT*, and because he argued on the $U(1)$ level.
2. The existence of $B^{(3)}$ was debated in a series of papers as follows: A. Lakhtakia, *Physica B*, **191**, 362 (1993); D.M. Grimes, *Physica B*, *ibid*, page 367; A.D. Buckingham and L. Parlett, *Science*, **264**, 1748 (1994); A.D. Buckingham, *Science*, **266**, 665 (1994). All of these papers appeared in print without Evans being informed, and he was denied the right of reply to all of them, so the reply to them appeared in *Found. Phys. Lett.*, **8**, 563 (1995)
3. Another debate of this nature appeared as follows: A. Lakhtakia, and M.W. Evans, *Found. Phys. Lett.*, **8**, 183, 187 (1995). Since $B^{(3)}$ is part of a valid $O(3)$ symmetry gauge theory, these criticisms are trivially incorrect. In Nov. 1994, Evans was heavily pressurized into resigning his position as full professor at UNCC and since then has been unsalaried. Many international protests were ignored by UNCC, which has ignored all correspondence on the matter.
4. Another debate took place between Rikken and Evans, following this enforced resignation, removal of salary, benefits and pension. From this point on, the replies by Evans were written privately with no University support. The debate papers were: G.L.J.A. Rikken, *Opt. Lett.*, **20**, 846 (1995) and M.W. Evans, *Found. Phys. Lett.*, **9**, 61 (1996). Evans was denied the right of reply in *Opt. Lett.* on the advice of Lakhtakia. Rikken himself encouraged the right of reply in *Opt. Lett.* In 1993, Lakhtakia had published Barrett's $SU(2)$ field equations, which give $B^{(3)}$.
5. Quite a good debate took place fairly between S.J. van Enk and M.W. Evans in *Found. Phys. Lett.*, **9**, 183, 191 (1996). It is now known that van Enk argued on the $U(1)$ level and so was trivially incorrect.
6. A series of four papers were written by E. Comay, the first of which appeared in *Chem. Phys. Lett.*, **261**, 601 (1996). Evans was denied the right of reply and so the reply appeared in *Found. Phys. Lett.*, **9**, 587 (1996) with S. Jeffers. Comay is trivially incorrect because he used a $U(1)$ Stokes Theorem to deal with the $B^{(3)}$ field, which does not exist in $U(1)$.
7. Comay and Evans debated the Lorentz covariance of the *B* cyclic theorem in *Found. Phys. Lett.*, **10**, 245, 255 (1997). The *B* cyclic theorem is an identity which is trivially Lorentz covariant since it is part of a Lorentz covariant gauge theory, so Comay was trivially incorrect, arguing as he did on the $U(1)$ level.

8. Comay and Evans debated the issue of $B^{(3)}$ and dipole radiation, Comay again arguing on the U(1) level, where there is no $B^{(3)}$, and again being trivially incorrect. Comay's paper appeared in *Physica B*, **222**, 150 (1996) without Evans' knowledge; and the reply appeared in *Found. Phys. Lett.*, **10**, 403 (1997).
9. Evans' former colleagues at UNCC attacked him in print shortly after he had been forced to resign. These papers appeared entirely without his knowledge, and the authors refused to correspond with Evans. Their papers are as follows: M.Y.A. Raja, W.N. Sisk, M. Youssaf and D. Allen, *Appl. Phys. Lett.*, **67**, 2123 (1995); M.Y.A. Raja, W.N. Sisk and D. Allen, *Appl. Phys. B*, **64**, 79 (1997). The reply appeared in M.W. Evans, *Found. Phys. Lett.*, **10**, 255 (1997), and in the special issue of *Apeiron* on $B^{(3)}$. Raja et al. are trivially incorrect because they again argue on the U(1) level, confusing $B^{(3)}$ with a static U(1) magnetic field. Evans was never informed of the existence of these experiments, which he never saw being carried out.
10. V.V. Dvoeglazov independently demonstrated the Lorentz covariance of the B cyclic theorem in *Found. Phys. Lett.*, **10**, 383 (1997).
11. Evans was again attacked in print by Comay in another article in *Physica B*, which repeated Barron's original claim that $B^{(3)}$ violates C symmetry. This article again appeared entirely without Evans' knowledge. This was fully answered by M.W. Evans and L.B. Crowell in *Found. Phys. Lett.*, **11**, 595-600 (1998).
12. Evans was attacked by his co-editor, G. Hunter, in posters and papers disseminated at the second Vigier conference, containing considerable personal invective. Hunter publicly described Evans as a manic-depressive psychotic and was disciplined by his superiors at York University, Toronto. A paper by Hunter finally appeared in *Chem. Phys.*, **242**, 331 (1999), in which the invective and personal attacks in the original Vigier Two papers were edited out. This paper was refereed by A.D. Buckingham, and is answered in this collection and in an AIAS paper submitted to *Chem. Phys.* Hunter argues again on the U(1) level and is trivially incorrect. An AIAS paper accepted for publication in *Apeiron* also refutes his argument, using a non-Abelian Stokes Theorem.
13. Finally Evans was attacked in print by Warren et al., in *Mol. Phys.*, an article which appeared in print entirely without his knowledge. This was commented upon by Evans in *Found. Phys. Lett.*, **12**, 99 (1999).

CONCLUSION

These early critical papers are valueless, because they argue on the U(1) level. The frequent denials of reply and publication without informing Evans himself is a sour episode in the annals of science. Nevertheless, in fairness to the critics, fairness which they themselves rarely exhibited, they are given here for historical purposes. Appendix one printed above refutes U(1) using simple symmetry. The O(3) electrodynamics is a suggestion for improvement. In Nov. 1998, Evans suffered an episode of major acute depression, but survived, and continues to be active in the field. Recently, he has received several major recognitions and is indebted to Dr. Milan Mészáros for appointment as Director of AIAS. Dr. Evans' wife was also sent a letter by Dr. Hunter informing her that her husband is a manic-depressive psychotic. Hunter later broadcasted the contents of this letter extensively by e-mail, without Evans' knowledge, later asking for a "reconciliation" while simultaneously publishing the critical paper in *Chem. Phys.* without Evans' knowledge. This less than delightful letter to Dr. Laura J. Evans was returned to the Dean of York University, Toronto. Evans, in medical opinion, is not a manic-depressive psychotic, but is recovering from unipolar major depression and is now more or less fully fit but under close medical attention.

The critics work within $U(1)$ are obviously out of it. Some erroneous unpublished claims have been made recently as follows, and attributed to Evans as his errors. Thanks, but no thanks:

1. that $\nabla \times B$ cannot be proportional to B . This is incorrect;
2. that $B^{(1)}$ and $B^{(2)}$ contribute to the Sagnac effect. This was shown to be incorrect using simple vector language. Only $B^{(3)}$ contributes to it;
3. that Evans' calculations involving a round trip in space-time as described by Ryder are incorrect. This was countered again by detailed handwritten notes;
4. that the appearance of $A^{(1)} \times A^{(2)}$ in experiments such as the inverse Faraday effect is explicable within $U(1)$. This is incorrect because this object is identically zero in $U(1)$ by definition;
5. that parity inversion and normal reflection are not the same. This is incorrect, and was explained again using diagrams and handwritten notes. Thus, $O(3)$ is the only correct explanation of Snell's Law, interferometry and all physical optics, a major discovery. Off normal reflection was reduced to parity inversion by projection onto the normal;
6. it has been claimed that the Anderson experiment disproves $O(3)$, whereas the RFR effect exists at all levels of physics. A sensible RFR design has been proposed by Labounsky, Anastasovski and others. Anderson's result wrecks physics and non-linear optics in general, irrespective of whether $B^{(3)}$ exists or not;
7. it has been claimed that $B^{(3)}$ can only be a field stretching from zero to infinity because its curl and divergence are zero. This claim is again erroneous and was corrected in further notes. The $B^{(3)}$ obviously propagates with $A^{(1)} \times A^{(2)}$ because it is defined in terms of $A^{(1)} \times A^{(2)}$, the cross-product of two propagating potential differences.

The establishment has thrown almost everything at $B^{(3)}$ theory on the classical level, and has been discredited completely. It has been claimed that it violates C , and CPT , Stokes Theorem, Lorentz invariance, etc. etc. All complete nonsense. The $O(3)$ field equations are isomorphic with the Barrett equations and again, this was correctly derived by Evans independently of Barrett. They are also isomorphic with the Harmuth equations, and partially isomorphic with the Lehnert equations. They indicate photon mass as pointed out by Prof. Lehnert and Prof. Vigier.

The etiquette of scientific criticism has been torn to shreds, heavily damaging the progress of science. It has even been claimed recently that $B^{(3)}$ should not be published because it goes against the prevailing paradigm. If so, physics is moribund, byzantine, theology

So it can be concluded that $B^{(3)}$ has caused a lot of excitement!