58(5): Notes on Naive Unification
(Reissner / Nordstrom and Newman et. al.)

Naive unification of the gravitational and electromagnetic fields was first attempted by Reissner and Nordstrom in 1916, shortly after the discovery of the Schwarzschild solution. Naive unification is based on the Einstein Hilbert field equation and the minimal substitution rule: $\partial_\mu \rightarrow D_\mu$. So it does not consider torsion and uses the Christoffel connection. Therefore e/m in the field in naive unification cannot be considered to be the Cartan torsion as suggested by Cartan himself in the twenties. The minimal substitution rule leads to internal inconsistencies as described for example by Wald, chapter 6. Therefore the main deficiency of the naive unification method is that it does not incorporate spin or angular momentum into general relativity. It cannot be used to describe the electromagnetic, weak and strong fields, and is not a workable unified field theory. It cannot be used to produce the ECE Spin field $\underline{B}^{(3)}$. There are many other deficiencies of naive unification which are revealed by ECE theory.

58(5a): Misner and Newman / Penrose Theories

The 1963 Misner theory is restricted to the calculation of the Riemann form in gravitation, and does not consider torsion. It therefore uses only a part of ECE theory, its EH limit, but does use tetrads. Newman and Penrose (1962) also used tetrads but a more complicated spinor basis. It introduced the null tetrad but was still restricted to the torsion free limit. It does not provide a generally covariant unified field theory. The Misner and Newman / Penrose methods are variations on the theme of the EH theory.

There is some discussion of the spinor method by Barrett on pp. 306 ff Barrett and Grimes, but Barrett does not refer to the application offered by ECE theory. Cartan discovered spinors in 1913 (E. Cartan, "Les groupes projectifs qui ne laissent invariante aucune multiplicité plane", Bull. Soc. Math. de France, 41, 53-96, 1913). Also E. Cartan, The Theory of Spinors (Dover, NY, 1981)