Review of: "Conservation of Baryon and Lepton Number is an Effect of Electric and Magnetic Charges"

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Potential competing interests: No potential competing interests to declare.

This draft presents a proposal for an alternative theory of elementary particles. The alternative theory is not an extension of the Standard Model of particle physics but a substitute. It is based on a different gauge structure with different gauge quantum numbers.

The paper begins with a critique of the standard assignments of isospin and proposes what is called a "new nomenclature". I would like to stress that it is of course allowed to define any nomenclature. Nomenclature does not change physics. What changes physics is if the defining symmetries of the theory are modified. This distinction is not made clear in the paper. The paper seems to define "isospin" such that left-handed and right-handed quarks and leptons have the same "isospin" AND it seems to require that this so-defined "isospin" is the quantum number to which gauge bosons couple. (This is not spelled out explicitly, and the full Lagrangian of the constructed theory is not given).

It is a fundamental observational fact that left-handed and right-handed fermions couple differently to gauge bosons. This fact is ignored in setting up the theory of the present paper.

The paper goes on to conclude that hypercharge can be identified with Y=B-L. This reflects the mistake made before. For the left-handed fermions, this is true also in the Standard Model, but for the right-handed fermions, it is not. In the Standard Model, the hypercharge gauge boson thus couples to left-handed fermions proportionally to B-L, but it couples to right-handed fermions in a different way. This parity-violating behaviour has been confirmed experimentally. The present theory proposal ignores that fact.

The gauge theory constructed in the present paper thus cannot reproduce important, and experimentally confirmed, properties of the Standard Model. It can therefore be ruled out as a candidate for an improved theory of elementary particles.