Chapter 16

Epilogue

This book primarily discusses physical topics. It shows new theoretical elements and points out many SM errors. The arguments rely on well-established experimental data and mathematical properties of physical principles. These are objective scientific issues. However, it is interesting to know the ideas of some SM supporters. A description of one example of this kind is described below. It was written as a stand-alone text, and I put its contents here.

16.1 Background

For more than 50 years, particle physics activity has run under the rule stipulating that it is strictly forbidden to discuss the possibility that there are errors in existing theories. The dictum "shut up and calculate" stems from this policy (readers may search the web for this "instruction"). This quasi-religious atmosphere has resulted in the present state, where the SM is full of errors. Hence, the kind of people who flourish in the present particle physics community learn things by heart without having a genuine understanding of the internal logic of their theories.

The last statement is quite harsh. Therefore, I wish to substantiate it with a description of simple cases. The primary element of the current field theory is the Lagrangian density. For example, an important mainstream textbook says: "All field theories used in current theories of elementary particles have Lagrangians of this form" (see [20], p. 300). I completely agree that this is the right course. The Lagrangian density of different interactions takes a different form.

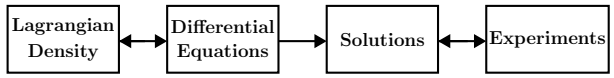

Figure 16.1: *Structure of a coherent field theory.*

Consider two important theories that describe the electromagnetic fields and the electron, called Maxwellian electrodynamics and the Dirac theory, respectively. These are relatively correct theories, and modern industry is based on them. Figure 16.1 illustrates the relations between crucial elements of each of these theories – a Lagrangian density, differential equations that are derived from the Lagrangian density, solutions of the differential equations, and relevant experimental results that fit the solutions.

All physicists and probably some mathematicians, chemists, and engineers have studied these theories. These people feel that they have studied solid, reliable theories.

Particle physicists study the electroweak theory, and they should recognize that the structure of this theory is completely different from that of Fig. 16.1 in the following ways:

F.1 Most textbooks do not show the full Lagrangian density of the electroweak theory.

F.2 No textbook shows the explicit form of the electroweak differential equations.

F.3 Clearly, no textbook shows solutions to these unknown equations.

F.4 Clearly, no textbook shows that the solutions to the unknown electroweak differential equations fit experimental data.

F.5 Apparently, members of the particle physics community are quite happy with this unfortunate plight. Indeed, many make declarations like the following: "The Standard Model: The most successful theory ever" [172,173]. Another example is taken from a textbook: "Remarkably, the Standard Model provides a successful description of all current experimental data and represents one of the triumphs of modern physics" (see [79], p.1). Furthermore, the Wikipedia policy represents the current consensus. As of August 2021, this grave situation of the electroweak theory is not mentioned on the Wikipedia list of unsolved problems in physics [93].

These facts substantiate my assertion that particle physicists study their theories in a quasi-religious form, and they do not strive to find logical coherence between elements of their theories. The events that are described below provide another example that substantiates my claim.

References:

[20] S. Weinberg, *The Quantum Theory of Fields,* Vol. I (Cambridge University Press, Cambridge, 1995).
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