model of approximate internal gauge symmetries in nuclear strong field and quark theory. The obvious truth in mathematics is that a symmetry is exact and can never be approximate. Quarks cannot exist approximately, yet this is what we are told, i.e. what must follow logically from the use of approximate symmetry as a foundational idea. The rational mind would conclude that quarks do not exist, they have merely been postulated to exist.

In the Evans field theory the abstract index of gauge theory is replaced by the geometrical index a of the tetrad, and that index is of course governed rigorously by the rules of differential geometry itself. There is no room for approximate geometry in human thought, and no room for subjective thought-entities such as quarks which exist approximately and are confined so as to be unobservable. Natural philosophy is the objective study of the observable in nature. Having rid ourselves of this cupboard full of skeletons known as the standard model it becomes much easier to see that the interaction of a Z boson and a neutrino is a matter of solving the Evans equations (21.28) and (21.29) on a desktop computer, avoiding the floating point overflow inevitably caused by infinities, i.e. avoiding the path integral method by using robust integrating software. Nature abhors a Feynman infinity as much as it abhors a broken Higgs vacuum. Both the infinity and the broken vacuum are untested products of the human mind (i.e. of subjective thought untested by data) and cannot exist in nature. The latter can be defined only by objective measurement.

In the diagrammatic form of the type familiar in particle scattering theory textbooks the Evans equations (21.20) and (21.22) are summarized by: This

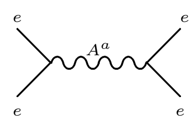

Fig. 21.1. Feynman Diagram

diagram summarizes the interaction of two electrons through the photon. Eqs. (21.28) and (21.29) are summarized by the diagram: illustrating the weak

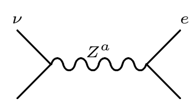

Fig. 21.2. Feynman Diagram

neutral current. An interaction between a Z boson and an electron is defined by the following two simultaneous Evans equations:

$$(i\hbar\gamma^a (\partial_a - ig_1 Z_a) - m_e c)\, q^a = 0 \tag{21.31}$$

$$(i\hbar\gamma^a (\partial_a + ig_1 Z_a) - m_Z c)\, Z^a = 0 \tag{21.32}$$

where g_1 is the appropriate coupling constant again proportional to e.

In general scattering theory it is customary to use the momentum exchange diagram: which indicates the following processes:

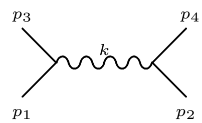

Fig. 21.3. Feynman Diagram

$$p_1 + p_2 = p_3 + p_4 \tag{21.33}$$

$$p_1 + k = p_3 \tag{21.34}$$

$$p_2 - k = v \tag{21.35}$$

By adding Eqs. (21.34) and (21.35) it becomes clear that a boson momentum k is gained and lost simultaneously as follows:

$$(p_1 + k) + (p_2 - k) = p_3 + p_4 \tag{21.36}$$

This is what is known with traditional obscurity of language as a virtual boson. This general process is also describable by the appropriate simultaneous Evans equations. In order to describe the transmutation processes that occur in radio activity more than two Evans equations must solved simultaneously using powerful enough contemporary hardware and software. This fact is illustrated by the scattering process: mediated by the charged weak field boson W^-. In

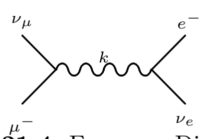

Fig. 21.4. Feynman Diagram

the above diagram the customary notation of particle scattering theory has been followed. Here $\mu^-$is the muon, a fermion with a mass about 207 times greater than the electron and a lifetime of 2.2×10^{-8} sec, ν_μ is the muon–neutrino, e^- is the electron, and ν_e is the electron-neutrino. By reference to diagram (21.4) the process in diagram (21.2) is the following conservation of momentum:

$$p\left(\mu^-\right) + p\left(\nu_e\right) = p\left(\nu_\mu\right) + p\left(e^-\right) \tag{21.37}$$

and Eq. (21.4) is denoted by the nuclear reaction, transmutation or radio-active process:

$$\mu^- + \nu_e = \nu_\mu + e^- \tag{21.38}$$