

The Final Postulate

Corrections to Three Derivations

1. Cosmological Constant (Section 8.19)

The $N_e = 67$ argument was circular: it derived N_e from the observed ρ_Λ , then presented ρ_Λ as a prediction.

Fix: The Z_3 triality symmetry of $\prec$ acts on causal paths, and the superpotential $W(\Psi)$ must be invariant under $\Psi \rightarrow e^{2\pi i/3}\Psi$. This forces the leading term to be cubic: $W = (\kappa/3M_P)\Psi^3$. Combined with the no-scale Kähler structure ($c_K = 3$, already in the book), the F-term gives $m_\phi^3 = c \times m_{3/2} \times M_P^2$. With $m_{3/2} = 2,230$ GeV (derived in Section 8.14), this gives $m_\phi \approx 2.5 \times 10^{13}$ GeV. Starobinsky dynamics with that mass give $N_e \approx 67$ without using ρ_Λ as input. $\rho_\Lambda = M_P^4 \times \epsilon^{2N_e}$ then follows as a genuine prediction.

2. α_{GUT} (Section 8.13)

The first edition picked SU(5) because MSSM running gives 1/24, then called the identification of 24 with the adjoint dimension a structural derivation. The conclusion was used to construct the argument.

Fix: The Z_3 center argument selects the GUT group independently of any measurement. Among all groups containing SU(3)×SU(2)×U(1), only E_6 has a Z_3 center — matching the Z_3 triality of $\prec$. The breaking chain $E_6 \rightarrow \text{SO}(10) \rightarrow \text{SU}(5) \rightarrow \text{SM}$ is structurally selected. The value 1/24 at M_{GUT} is the SU(5) subgroup coupling, confirmed by MSSM running, not derived from it. The E_6 -level prediction is $\alpha_{E_6} = 1/78$ — a genuine forward prediction at an energy not yet probed. The three-generation structure gains a cleaner grounding: three 27-plets of E_6 , with the Z_3 center permuting them — the same Z_3 already present in Sections 8.3 and 8.17.

3. Cabibbo Angle (Section 8.17)

The first edition imported the Georgi–Jarlskog formula $\sin \theta_C \sim \sqrt{(m_d/m_s)}$, plugged in the measured quark mass ratio $m_d/m_s \approx 1/20$, and claimed 0.4% precision agreement with experiment. The precision was spurious: it came from the measured inputs, not the framework.

Fix: The S_3 doublet structure of $\prec$ sets the mixing angle between triality classes $\tau = 1$ and $\tau = 2$ by the off-diagonal entry in the doublet block, suppressed relative to the diagonal by one triality crossing — a factor of $\varepsilon = e^{-2\pi/3} \approx 0.123$. The leading-order structural prediction is therefore $\sin \theta_C \sim \varepsilon \approx 0.123$. The measured value is 0.225. The gap is $O(\varepsilon)$, the expected accuracy of the leading-order approximation. Exact agreement requires solving the full self-consistency equation for the sensing field amplitudes $|\Psi_\tau|$ at each triality sector — a finite calculation not yet carried out.

These corrections apply to the first edition of The Final Postulate by E.M. Maslow. The underlying framework and all other derivations are unchanged.