(TWELVE +)

MOTIVATIONS FOR USING THE COMBINATORIAL HIERARCHY

1) A PROCESS THAT GENERATES STRUCTURE
   THE CHARACTERISTIC NUMBERS ARE SIGNIFICANT
2) DISCRETE

3) SELF-REPRODUCING (HIERARCHICAL)
   "SCALE INVARIANT" CONSERVATION LAWS
4) RAPIDLY GROWING COMPLEXITY/LEVEL
   - RICH - NON-POLYNOMIAL

5) MUST BE COMBINATORIAL, NOT EXPONENTIAL

6) ELEMENTS ARE <u>BOTH</u> OPERATORS AND OPERANDS

7) IF UNIVERSAL, THEN MUST BE SELF RERRESENTING TOO!

8) MATHEMATICAL CORRESPONDENCE PRINCIPLE DEMANDS SOMETHING LIKE $2^N - 1$

9) DISTINGUISHABILITY $\longrightarrow$ DISCRIMINATION OVER Z_2

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10) "PHYSICAL" CHARACTER OF REPRESENTATION DEMANDS
- NON-SINGULAR OPERATORS (I.E. INVERTIBLE MAPS BETWEEN ELEMENTS)
THESE ARE THE INTERNAL COORDINATE AUTOMORPHISMS

- WITH Z_2 SOMETHING "LIKE" N^2 IS THEN ONLY ANSWER

11) UNIQUE SELF-REPRESENTATION IS LIMITED TO FOUR LEVELS — THEREAFTER WE HAVE NO NOVELTY

12) THE CHARACTERISTIC NUMBERS OF THE STRUCTURES SO GENERATED ARE APPROPRIATE FOR PHYSICAL INTERPRETATION.

SOME COMMENTS

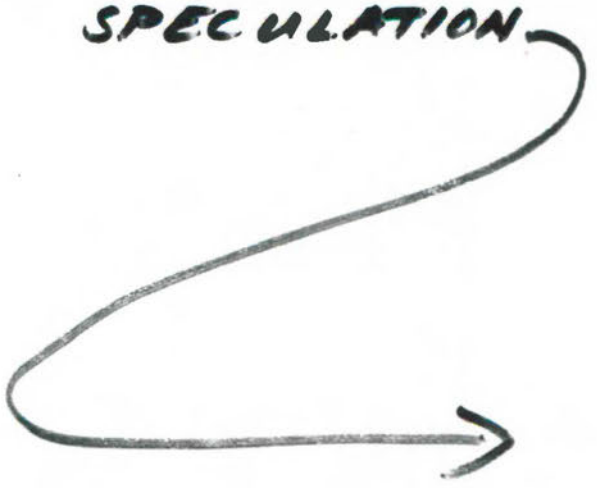
i - A NEW CORRESPONDENCE PRINCIPLE

A: A MATHEMATICAL THEORY OF PROCESS, DISCRETENESS, AND GEOMETRY IS NEEDED - I USE O.O.C. (ORDERING OPERATOR CALCULUS)

B: THE FINE STRUCTURE CORRECTION HAS A HISTORICAL AND OPERATIONAL BASIS.

C: COMBINATORIAL, FINITE STEP LENGTH SOLUTIONS TO THE DIRAC WAVE FUNCTION CAN BE GIVEN DIRECTLY AND ARE EXACT MATHEMATICALLY.

D: I FEEL CONFIDENT ENOUGH TO ENGAGE IN ONE MORE ACT OF SPECULATION



AS FOLLOWS

LET $\bar{\alpha}_1 = 137 \cdot 2\pi$

["LINEAR", FIRST ORDER APPROX.]

MODEL ELECTRON "MASS" AS

1) PRIMARILY DUE TO COULOMB EVENTS $(137 \cdot 2\pi)$

2) DUE TO A LEVEL 2 SELF INTERACTION
(6 of every 7 events ARE indistinguishable between the electron AND itself)

3) EFFECTS DUE TO VIRTUAL ELECTRON "GENERATION" DO NOT CONTRIBUTE

WRITE THIS IN LEVEL 1 "UNITS"

I. $$m_e = \frac{3}{7} \cdot \bar{\alpha}_1 \cdot \left[1 - \left(\frac{6}{3.7}\right)^N\right] \Big/ \left[1 - \left(\frac{6}{3.7}\right)\right]$$

WHERE N IS THE DEGREE OF SELF INTERACTION

TREAT m_p AS THE PROTON "MASS" AS CONSISTING OF "BARE" "MASS" PLUS A PORTION DUE TO LEVEL 1 / LEVEL 2 COUPLING (i.e $\frac{3}{7}$).

AS WITH THE ELECTRON, ELIMINATE VIRTUAL GENERATION.

WRITE THIS AS

$$m_p(\text{"BARE"}) = [m_p - m_p(\text{COUPLING})] \div m_p(\text{virtual})$$

OR

II. $$m_p(\text{"BARE"}) = \frac{m_p \cdot (1 - \frac{3}{7})}{[1 - (\frac{6}{3 \cdot 7})]}$$

COMBINING I. AND II.

WE OBTAIN →

$$\frac{m_p}{m_e} = \frac{\left[1-\left(\frac{6}{3\cdot 7}\right)\right] \Big/ \left(1-\frac{3}{7}\right)}{\frac{3}{7}\cdot\frac{1}{2\pi}\cdot\frac{1}{137}\cdot \underbrace{\left[1-\left(\frac{6}{3\cdot 7}\right)^N\right] \Big/ \left[1-\left(\frac{6}{3\cdot 7}\right)\right]}_{N^{th}\ \text{partial sum}}}$$

WHICH, FOR $N=3$, IS

ALGEBRAICALLY IDENTICAL

TO

$$\frac{m_p}{m_e} = \frac{137\pi}{\frac{3}{14}\cdot\left(1+\frac{2}{7}+\frac{4}{49}\right)\cdot\frac{4}{5}}$$

$$= 1836.151497$$

A' LA PARKER-RHODES RESULT
VIA INTEGRALS

BUT IS PURELY COMBINATORIAL!