2016-02-07.19:18 Sun 21:42

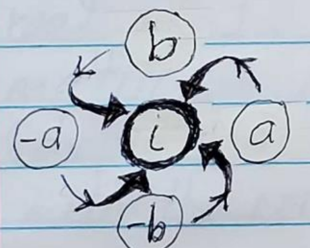
A new mapping of S_4 balanced diagonal matrices to symbols

	-i	a	b	-a	-b	i
-i	-1	b	-a	-b	a	1
a	-b	1	i	-1	-i	b
b	a	-i	1	i	-1	-a
-a	b	-1	-i	1	i	-b
-b	-a	i	-1	-i	1	a
i	1	-b	a	b	-a	-1

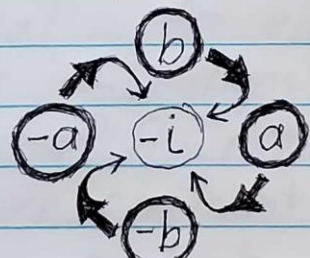
1 = pole = p
-1 = stack = s = -p
a = wake = w
-a = doze = d = -w
b = candle = c
-b = tree = t = -c
i = fall = f
-i = rise = r = -f

$a^2 = b^2 = 1; \quad i^2 = -1$

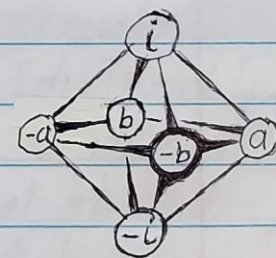
$ab = i, \ ba = -i; \quad ai = b, \ ia = -b; \quad ib = a, \ bi = -a$



Top View of Top of Octahedron



Top View of Bottom of Octahedron



Front View of Octahedron

Note: This is not the same mapping of permutation matrices to math units that I used before. However, from this point forward I will use this one. For the math units the goal was to have ab=i. For the matrices, I generally wanted positive symbols to have left-upper vertical diagonals. The word names are new. 21:40

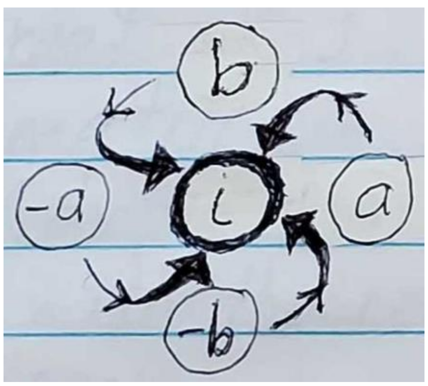
Terry Bollinger 2016-02-07.21:43 Sun

[2016-02-07.19:18 Sun> [21:42]
[A new mapping of S4 balanced diagonal matrices to symbols]

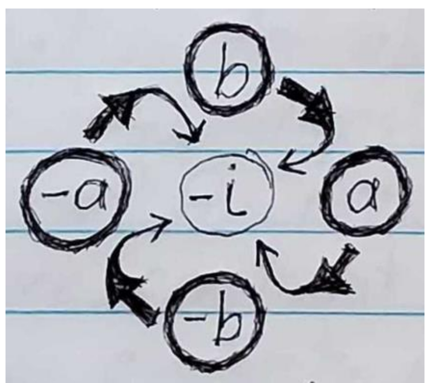
	$^{-i}\langle - \vert \rangle$	$^{a}\langle \vert\vert \rangle$	$^{b}\langle \perp \rangle$	$^{-a}\langle \text{--} \rangle$	$^{-b}\langle \top \rangle$	$^{i}\langle \vert - \rangle$
$^{-i}\langle - \vert \rangle$	$^{-1}\langle = \rangle$	$^{b}\langle \perp \rangle$	$^{-a}\langle \text{--} \rangle$	$^{-b}\langle \top \rangle$	$^{a}\langle \vert\vert \rangle$	$^{1}\langle \text{¦} \rangle$
$^{a}\langle \vert\vert \rangle$	$^{-b}\langle \top \rangle$	$^{1}\langle \text{¦} \rangle$	$^{i}\langle \vert - \rangle$	$^{-1}\langle = \rangle$	$^{-i}\langle - \vert \rangle$	$^{b}\langle \perp \rangle$
$^{b}\langle \perp \rangle$	$^{a}\langle \vert\vert \rangle$	$^{-i}\langle - \vert \rangle$	$^{1}\langle \text{¦} \rangle$	$^{i}\langle \vert - \rangle$	$^{-1}\langle = \rangle$	$^{-a}\langle \text{--} \rangle$
$^{-a}\langle \text{--} \rangle$	$^{b}\langle \perp \rangle$	$^{-1}\langle = \rangle$	$^{-i}\langle - \vert \rangle$	$^{1}\langle \text{¦} \rangle$	$^{i}\langle \vert - \rangle$	$^{-b}\langle \top \rangle$
$^{-b}\langle \top \rangle$	$^{-a}\langle \text{--} \rangle$	$^{i}\langle \vert - \rangle$	$^{-1}\langle = \rangle$	$^{-i}\langle - \vert \rangle$	$^{1}\langle \text{¦} \rangle$	$^{a}\langle \vert\vert \rangle$
$^{i}\langle \vert - \rangle$	$^{1}\langle \text{¦} \rangle$	$^{-b}\langle \top \rangle$	$^{a}\langle \vert\vert \rangle$	$^{b}\langle \perp \rangle$	$^{-a}\langle \text{--} \rangle$	$^{-1}\langle = \rangle$

$1 = \langle \text{¦} \rangle = \text{pole} = p$
$-1 = \langle = \rangle = \text{stack} = s = -p$
$a = \langle \vert\vert \rangle = \text{wake} = w$
$-a = \langle \text{--} \rangle = \text{doze} = d = -w$
$b = \langle \perp \rangle = \text{candle} = c$
$-b = \langle \top \rangle = \text{tree} = t = -c$
$i = \langle \vert - \rangle = \text{fall} = f$
$-i = \langle - \vert \rangle = \text{rise} = r = -f$

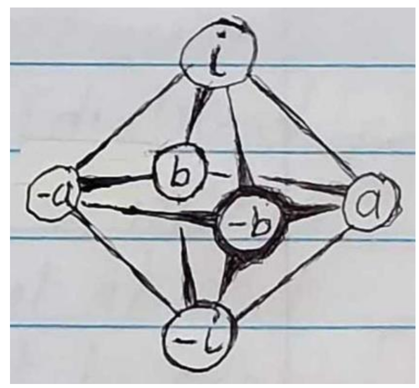
$$a^2 = b^2 = 1 \quad ; \quad i^2 = -1$$
$$ab = i,\ ba = -i \quad ; \quad ai = b,\ ia = -b \quad ; \quad ib = a,\ bi = -a$$



Top View of
Top of Octahedron



Top View of
Bottom of Octahedron



Front View
of Octahedron

Note: This is not the same mapping of
permutation matrices to math units
that I used before. However, from this
point forward I will use this one. For
the math units the goal was to have ab=i.
For the matrices, I generally wanted positive symbols
to have left-upper vertical diagonals. The word names are new.
[21:40]

[Additional explanatory notes are on the next page]

[2023-12-16.21:23 Sat> The matrix representations of the octahedron vertices are show below. Imagine the matrices tilted 45° clockwise to balance on the lower right corner, then connect the "1" entries in each 2x2 submatrix to see get the pairs of lines shown in the shorthand notations.

$$1 = \langle ¦ \rangle = \begin{pmatrix} \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \\ \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} \end{pmatrix} = \text{pole} = p$$

$$-1 = \langle = \rangle = \begin{pmatrix} \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \\ \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} \end{pmatrix} = \text{stack} = s = -p$$

$$a = \langle \Vert \rangle = \begin{pmatrix} \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} \\ \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \end{pmatrix} = \text{wake} = w$$

$$-a = \langle \text{--} \rangle = \begin{pmatrix} \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} \\ \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \end{pmatrix} = \text{doze} = d = -w$$

$$b = \langle \perp \rangle = \begin{pmatrix} \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \\ \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} \end{pmatrix} = \text{candle} = c$$

$$-b = \langle \top \rangle = \begin{pmatrix} \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \\ \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} \end{pmatrix} = \text{tree} = t = -c$$

$$i = \langle \vdash \rangle = \begin{pmatrix} \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} \\ \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \end{pmatrix} = \text{fall} = f$$

$$-i = \langle \dashv \rangle = \begin{pmatrix} \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} \mathbf{1} & 0 \\ 0 & \mathbf{1} \end{pmatrix} \\ \begin{pmatrix} 0 & \mathbf{1} \\ \mathbf{1} & 0 \end{pmatrix} & \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \end{pmatrix} = \text{rise} = r = -f$$

These matrices are interesting due both to the unexpected rotational symmetries they show in the octahedral faces, and to how those faces then correspond to the fermions and anti-fermions in the Standard models. In my later volumes, they became the octahedral face-product version of the Glashow Cube. Base on my work since then, my best guess is the rotational symmetries link directly to the generation of time flow and space, with the fermions representing local "incomplete" versions of the time flows possible. [2023-12-16.21:56 Sat]