Refutation of the Born rule in EQM as the probability of the wave function squared

We assume the method and apparatus of Meth8/VŁ4 with `T`autology as the designated *proof* value, `F` as contradiction, `N` as truthity (non-contingency), and `C` as falsity (contingency). The 16-valued truth table is row-major and horizontal. Result fragments are the repeating truth tables. Operators are: ~ Not; + Or; > Imply, →; = Equivalent.

From: Carroll, S. (2014). Why probability in quantum mechanics is given by the wave function squared. preposterousuniverse.com/blog/2014/07/24/why-probability-in-quantum-mechanics-is-given-by-the-wave-function-squared/, preposterousuniverse.com/blog/wpcontent/uploads/2014/07/quantum-slu.jpeg .

LET p, s, t, u, v, w: $|O_0\rangle$, $(1/\sqrt{2})$, $|\uparrow\rangle$, $|A_0\rangle$, $|e_0\rangle$, $|A_\uparrow\rangle$.

$|\psi\rangle =$ $|O_0\rangle ((1/\sqrt{2})|\uparrow\rangle + (1/\sqrt{2})|\downarrow\rangle) |A_0\rangle |e_0\rangle$ (1.1.1)

(p&((s&t)+(s&~t)))&(u&v) ; (1.1.2)

`FFFFF FFFF FFFF FFFF, FFFF FFFF FTFT FTFT`

→ $|O_0\rangle ((1/\sqrt{2})|\uparrow\rangle|A_\uparrow\rangle + (1/\sqrt{2})|\downarrow\rangle|A_\downarrow\rangle) |e_0\rangle$ (apparatus measures) (1.2.1)

(p&((s&w)+(s&~w)))&v ; (1.2.2)

`FFFFF FFFF FFFF FFFF, FFFF FFFF FTFT FTFT`

We now reduce the argument to four variables for simplicity.

LET p, q, r, s: $|O_0\rangle$, $|O_\uparrow\rangle$, $|\uparrow\rangle|A_\uparrow\rangle|e_\uparrow\rangle$, $(1/\sqrt{2})$.

→ $(1/\sqrt{2})|\uparrow\rangle|A_\uparrow\rangle|e_\uparrow\rangle + (1/\sqrt{2})|\downarrow\rangle|A_\downarrow\rangle|e_\downarrow\rangle$) (decoherence) (1.3.1)

p&((s&r)+(s&~r)) ; `FFFF FFFF FTFT FTFT` (1.3.2)

= $(1/\sqrt{2})|O_0\rangle|\uparrow\rangle|A_\uparrow\rangle|e_\uparrow\rangle + (1/\sqrt{2})|O_0\rangle|\downarrow\rangle|A_\downarrow\rangle|e_\downarrow\rangle$ (*self-locating uncertainty*) (1.4.1)

s&((p&r)+(p&~r)) ; `FFFF FFFF FTFT FTFT` (1.4.2)

→ $(1/\sqrt{2})|O_\uparrow\rangle|\uparrow\rangle|A_\uparrow\rangle|e_\uparrow\rangle + (1/\sqrt{2})|O_\downarrow\rangle|\downarrow\rangle|A_\downarrow\rangle|e_\downarrow\rangle$ (measurement compete) (1.5.1)

s&((q&r)+(~q&~r)) ; `FFFF FFFF TTFF TTFF` (1.5.2)

Eqs. 1.1.2-1.5.2 as rendered are *not* tautologous.

We rewrite Eqs. 1.1.1-1.5.1 as: (1.1.1 → 1.2.1) → (1.3.1 = (1.4.1 → 1.5.1)). (1.6.1)

(((p&((s&t)+(s&~t)))&(u&v))>((p&((s&w)+(s&~w)))&v))>
(p&((s&r)+(s&~r)))=((s&((p&r)+(p&~r)))>(s&((q&r)+(~q&~r)))) ; (1.6.2)

`FFFF FFFF FTFF FFFT`

Eq. 1.6.2 is *not* tautologous, but differs from contradictory by two `T` values. This means the Born rule is refuted in Everettian quantum mechanics (EQM).