

What Wolfgang Pauli did mean?

(version)

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Abstract

An attempt of interpretation and application

in modern physics “recipe” of Pauli:

“Division and reduction of symmetry

this then is the kernel of the brut!”

In the book [1] Werner Heisenberg told about Christmas card send by Wolfgang Pauli in 1957 to him with incomplete scientific idea. Pauli express this idea short and enigmatic:

"Division and reduction of symmetry, this then is the kernel of the brute! The former is an ancient attribute of the devil."

The original German quotation is: "Zweiteilung und Symmetrieveminderung, das ist des Pudels Kern. Zweiteilung ist ein sehr altes Attribut des Teufels." Here Pauli refers to Goethe's Faust.

English equivalents of “das ist des Pudels Kern” are “the gist of the matter” or “the crux of matter”. “Division and reduction of symmetry” is the essence of the idea.

Unfortunately, soon in 1958 Pauli died from a pancreas cancer and its mysterious phrase remains till now not decoded.

I tried to understand this sentence and asking from famous modern physicists. I quoting their answers

From Frank Wilczek:

“I'm not familiar with the quote or its context, so I can only speculate. It might refer to "reduction" of the wave packet, with the idea that this might allow a fully symmetric initial or basic wave function to describe the universe as we observe it, which has reduced symmetry.

All best wishes,
 Frank Wilczek”
 May 27 2004

From Gerhard t'Hooft:

“Famous example is the Donkey of Buridan: it was given two identical haystacks, some distance apart. Since they were identical, the donkey could not choose, so it died of starvation. Of course, real donkeys will immediately choose one of the two and start eating, but whatever solution it takes, the solution will break the perfect symmetry between the two haystacks. Pauli probably meant that Nature is full of such Donkeys, choosing one haystack, no matter which, and breaking symmetries that way.”

G. 't Hooft
 June 08 2004

Then i tried find out my own interpretation. By this time I had ideas connected with concept of metasymmetry and Ratio 3:1[2] Once I have paid attention to paper "Extended Supersymmetry And Extended Supergravity Theories"[3] and on the table from this paper. Author was Joel Scherk (1946--1980) an important early contributor to the development of string theory.

TABLE VIII										
J	1	2	3	4	5	6	7	8	9	10
5/2									1	1
2		1	1	1	1	1	1	1	10	10
3/2	1	1	1	2	1	4	5	6	8	45
1	1	1	1	2	1	3	3	1	4	6
1/2	1	1	2	2	1	4	3	1	4	7
0	2		4	2		6	2		10	10
G	SO(1)	SO(2)	SO(3)	SO(4)	SO(5)	SO(6)	SO(7)	SO(8)	SO(9)	SO(10)

Table from paper "Extended Supersymmetry And Extended Supergravity Theories"

Pay attention to dark green rectangle. If cut this rectangle by half (division of symmetry) and ignore upper half of rectangles, can get: [spin 1 -3 particles and spin 1/2 -1 particle] Could be fit to real situation in the Nature inversion of this half-picture: [spin 1/2 -3 particles (proton,electron,neutrino) and spin 1 - 1 particle (photon)]. In this case we would be convinced of the validity of recipe “division and reduction of symmetry”. Nevertheless it is interesting result and tell as that the true is close. If we understand reason of the inversion, can we will come to to the following radical conclusions:

- 1) Supersymmetry not exist in the Nature.
- 2) Gravitation is not fundamental force. Confirmation Andrei Sakharov's induced gravity view[4].

3)Ratio 3:1 as possible confirmation abovementioned theses

And then it will appear Freeman Dyson was right: "I like Bohr's division, because it allows the possibility that gravitons may not exist. If the scope of quantum theory is limited, gravity may legitimately be excluded from it"[5] "I feel the same way about gravitons"[6]
As Richard Feynman told:" Every time is needed to seek a new path"[7]

References

1. Werner Heisenberg "Physics and Beyond", Harper and Row, New York, 1974, p.234
2. Yuri Danoyan "Is Ratio 3:1 a comprehensive principle of the Universe?" [viXra:0907.0008](#) [\[pdf\]](#)
3. Joel Scherk "Extended Supersymmetry And Extended Supergravity Theories" LPTENS-78-21, Sep 1978. p.15.
4. Matt Visser Sakharov's induced gravity: a modern perspective <http://arxiv.org/abs/gr-qc/0204062>
5. Freeman Dyson The scientist as rebel Random House Inc. p222
6. Freeman Dyson "The world on a string" New York Rev. Books 51 (8) (2004)
7. Richard Feynman "Character of Physical Law"