On the Soviet Contribution to the Discovery of Quark Color
(Against One False Revision)

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Abstract

A critical discussion of recent attempts to revise the modern physics history is presented.

Time after time new versions of historical records concerning questions of priority appear. For instance, because of some documentary findings that may disprove an established opinion. Unfortunately, some materials are composed and displayed mostly to cause a sensational effect, but without sufficient reason.

The present note concerns the discovery of a new quantum number for quarks made in 1965 independently by several authors [1a]-[1d]. The very quantum number was later dubbed “color”. In the USSR it was done in the beginning of 1965 by N.N. Bogoliubov, B.V. Struminsky and A.N. Tavkhelidze [1a]. However, their paper was not published in a regular physical journal and remained a preprint in Russian. In the West it became known mostly as A.N. Tavkhelidze’s talk [2] at the 1965 Trieste conference on high-energy physics and elementary particles (see, e.g., the references in paper [3]). Nonetheless, it was generally believed that the Soviet contribution was made in paper [1a].

Recently, however, an arXiv publication [4] has appeared in which this opinion was contested in very strong terms. The main point is as follows:

There exists a preprint by B. V. Struminsky alone [5] which preceded the preprint [1a] and - what is the most important – which contained a footnote:

“Three identical quarks cannot be in an antisymmetric S-state. In order to form an antisymmetric S-state one has to attribute to the quark an additional quantum number.”

Being based on this and some other mostly emotional and poorly based observations, supplemented with investigations à la home-bred Sherlock
Holmes in the JINR Library the author of [4] came to an unambiguous conclusion:

The Soviet contribution into the discovery of color is due to solely B.V. Struminsky.

In Ref. [4] this is expressed quite carefully (original orthography):

“The idea that an internal quantum number for quarks, eventually called color, can help explain the magnetic moments of baryons within the framework of standard quantum theory, was explicitly stated in a 7th January, 1965 JINR publication by Boris Struminsky”.

“...the symmetry argument leading to the additional quantum number was fully and explicitly present in the booklet [1]” (Ref. [5]) in our references).

As to Ref. [1a] it only “made an important contribution to clarifying the dynamic aspect of the quark magnetic moments”. No more.

With all this and many vague allusions and reservations the author of Ref. [4] thoroughly brings the reader to another – implicit but factual – conclusion:

N.N. Bogoliubov committed an immoral deed: he “hanged on” Struminsky’s discovery.

This year scientists of many countries celebrate 100-year anniversary of N. N. Bogoliubov, an outstanding and renowned Russian/Soviet mathematician and physicist, who contributed so much into the most important fields of the XX-th century mathematics and physics: nonlinear mechanics, microscopic theory of superfluidity and superconductivity, kinetic equations (BBGKY hierarchy), renormalization theory (Bogoliubov-Parasiuk-Hepp-Zimmermann R-operation and first consistent formulation of the renormalization group), axiomatic field theory (Bogoliubov’s system of axioms, first rigorous proof of the dispersion relations) etc etc. In usual competition among physicists of different schools the sides could be sometimes quite hostile but never
a question about ethical behavior of Bogoliubov has been raised. Nonetheless, now we are in front of rather grave and blasphemous invectives made by the author of Ref. [4].

This is our moral debt to give a due reply. To this end we would like to present the following considerations.

1. Bogoliubov published many papers with co-authors. In cases he considered their own separate contributions deserving special mentioning he did it with a perfect willingness. For instance, in a series of papers devoted to the R-operation, he worked on together with O.S Parasiuk, he made a reference to the paper written by Parasiuk alone in which the latter proved some important theorem (see, e.g., the book “Introduction to the Theory of Quantized Field” by Bogoliubov and Shirkov).

2. According to memoirs of Bogoliubov’s disciples and co-workers his attitude towards them leaves no room for doubts in his decency.

“This was a very particular feature of Nikolai Nikolaevich: when he “puzzled” any of his colleagues, he always solved the problem by himself, and later, if the results coincided, he always said: “But you did it better”” [6].

3. In paper [5] B.V. Struminsky thanks his supervisor Bogoliubov for posing a problem and attention:

“The author expresses his sincere gratitude to Academician N.N. Bogoliubov for the suggested problem and attention”.

4. In subsequent papers by Struminsky the references concerning the invention of color were made always to paper [1a] only. One can find in paper [1a] a reference to Struminsky’s earlier paper [5] but not in relation with the new quark quantum number but in relation to the quark magnetic moments only. As to the color, Struminsky (in a joint paper with A.N. Tavkhelidze) wrote afterwards:

“Another (in compare with parastatistics – our note) method to overcome the difficulty mentioned above was suggested in the works of N.N. Bogoliubov et al. [6] ([1a] in our references) and those of Nambu and Han [13] ([1b] in our references). The main idea of these works is the introduction of
three quark triplets and construction of baryons from three different quarks” [7].

Why on the earth the genuine author of a discovery decided to ascribe it to somebody else? Why did he never express even a little bit of doubt in the accepted version of events?

5. N.N. Bogoliubov, when having spoken about Soviet contribution to the discovery of the quark color, always meant and referred to paper [1a] and never to Ref. [5].

A clear way out of this false problem is to acknowledge that Bogoliubov has informed his PhD student Struminsky in general terms on resolution of the quark statistics problem. We would like to stress that all this in no way diminishes a scientific authority of B.V. Struminsky himself.

Résumé: an attempt of a revisionistic sensation produced in Ref. [4] has no grounds.

References

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