PHYSICS ARCHITECTURE. PART TWO

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The talk is devoted to the jubilee of academician M.A.Markov, who was born in 1908. Now we have also 100th anniversary of the gauge invariance principle proposed by Weyl in 1918. During the period from 1967 to 1988 M.A.Markov was academician secretary of AN USSR Nuclear Department. He organized the line of conferences dedicated to actual problems of theoretical, nuclear and elementary particle physics. One of them was international seminar "Vector mesons and electromagnetic interactions" under A.M.Baldin direct leadership. It went off in JINR in September of 1969. Just that seminar gave birth to the conferences line named "Baldin autumn". The discussions at the A.M.Baldin seminar were subsequently very useful for many critical situations in theoretical and experimental physics.

The first of plenary session of the seminar included L.D. Faddeev talk about gauge field quantization, which cleared the way to construction of renormalized quantum gauge field theory. My talk was dedicated to the transformation of the classical gauge field theory into geometrical one. As a result the unified geometrical theory was obtained, which could include any interactions together with Einsteinian gravity. In this connection both formulations of Weyl's local gauge invariance principle (of 1918 and 1929) as well as Einsteinian principle of general relativity were used. This approach was based on the fibre bundle geometry, which was created by mathematicians at that time. This theory makes realizable classification of interactions in accordace with the local Lie's symmetry groups associated with them. Such approach leads to the VIIth Hilbert's problem solution.

To obtain further development of the gauge field theory it is necessary to decide the question of the gauge field mass origin. It is key moment both in quantum and in geometrical classical theories of the gauge fields. Therefore it is very important to analyse the experiments, which massive and massless particles are converted in each other in (similar Baldin experiments in JINR in 1967).