A model in which nucleons and mesons are bound states of quarks is used to predict relations between forward scattering amplitudes under the 'proton-hadron' and the hadron-hadron amplitude hypotheses. The sum of the scattering amplitudes of the constituent quarks and mesons is the sum of the scattering amplitudes of the constituent quarks. Relations between nucleon-nucleon and meson-nucleon scattering amplitudes which are unrelated by any other description. (The SCL9 indicates that this paper has been cited in over 305 publications since 1966.)

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"By 1965 Gell-Mann1 and Zweig2 had proposed that nucleons were made of smaller objects called quarks. Greenberg3 had shown that the degree of freedom now called 'color' solved the statistics problem, and Nambu had shown that a gauge theory with colored quarks (now called QCD) reproduced the gross features of the hadron spectrum.4,5 But the particle physics 'establishment' had 'just barely given up the fight against SU(3) symmetry and the whole quark idea was dismissed as complete nonsense, particularly in America."

"A few European groups took quarks seriously. A few others, including Andrei Sakharov, then at the Weizmann Institute under this program was Florian Scheck, who had a background in nuclear physics and was interested in learning particle physics. Calculating predictions from the quark model was an ideal exercise to start him off. Having been brainwashed by the establishment, I did not expect any dramatic results. The existence of quarks was questionable and there was no justification for our basic assumptions not only that mesons and baryons were made out of quarks but also that a two-particle collision could be described as a collision between an 'active' quark in one particle and an 'active' quark in the other, with the remaining 'spectator' quarks just going along for the ride. This model gave new predictions6 relating nucleon-nucleon scattering to meson-nucleon scattering which could not be obtained without the quark picture; e.g., that $g_{pp}(0)=3g_{nn}(0)$. We were astonished when the new data showed remarkable agreement with nontrivial predictions of the model."

"We were fortunate in having excellent guides to direct us to the relevant recent experimental data, which was quite meager at that time. Gerson and Sula Goldhaber were then visiting Weizmann, shortly before Sula's unexpected death. During our very productive discussions, she was already complaining about severe headaches."

"This work began a research program on what is now called the 'quark model,' but which was initially greeted with extreme skepticism. One of our early papers7 was accepted for publication only after new experimental results, which were unavailable when the paper was written, confirmed our predictions. It had been dropped down in arguments with referees who insisted the quarks did not exist and our work was completely wrong."

"During the past 18 years an accumulation of overwhelming experimental evidence has forced the acceptance of the quark model on the reluctant theorists. The new particle line is quantum chromodynamics, a theory in which the basic building blocks of matter are quarks. The additive quark model has been accepted, developed in many directions, and is a major tool in analyses and predictions of experimental results. Many papers have been written which use the additive quark model. Of all these papers, our paper and the one by Levin and Frankfurt8 are still cited as the first ones that started this ball rolling."