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Valentine Louis Telegdi

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physics. To explain the pattern of the baryon $SU(3)$ octet and decuplet representations required assuming what became known as a symmetric quark model, in defiance of the established antisymmetry for fermions. Over the following decades, many other resonances were discovered for both baryons and mesons, in many cases by application of Dalitz plots. During that time, the nonrelativistic quark model, with later incorporation of color $SU(3)$ effects from quantum chromodynamics, became established as an orderly description of what had formerly been a menagerie of particles.

For Dick, quarks were real, but as his student in 1968, I found that being asked to believe in fractionally charged particles that no one had seen and that few outside Oxford took seriously could be demoralizing. When their reality began to emerge in deep inelastic scattering data around that time and Richard Feynman developed his parton model, Dick seemed hesitant to push the new area forward. With quarks as with the $\theta-\tau$ analysis earlier and the eponymous Dalitz plot, he had helped pave the way in different manners for Nobel Prizes, but he never made the final step himself.

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Valentine Louis Telegdi

On 8 April 2006, Valentine Louis Telegdi died in Pasadena, California, of complications following surgery for an aortic aneurysm. With his passing the physics community lost one of its most original and distinguished members. Val's contributions to our understanding of weak and electromagnetic interactions are seminal. Beyond those contributions, though, what made Val unique was the depth of his understanding of the theoretical fine points of the physics, which in his fundamental particle-physics experiments led him to beautiful and far from obvious ways of testing an idea. A Telegdi experiment was always marked as much by the conceptual cleverness of its design as by the importance of its results.

Val was born on 11 January 1922 in Budapest, Hungary. After wandering all over Europe, the Telegdis ended up in Italy. From there they sought wartime shelter in Switzerland but did not find it until 1943, when in the wake of the German army's defeat at Stalingrad, the Swiss reoriented the tilt of their much-vaunted neutrality. Ending up in Lausanne, Val attended the legendary lectures in which Ernst Stueckelberg discussed his causal propagator and those remarkable diagrams that were also independently discovered and put to marvelous and universal use by Richard Feynman after World War II.

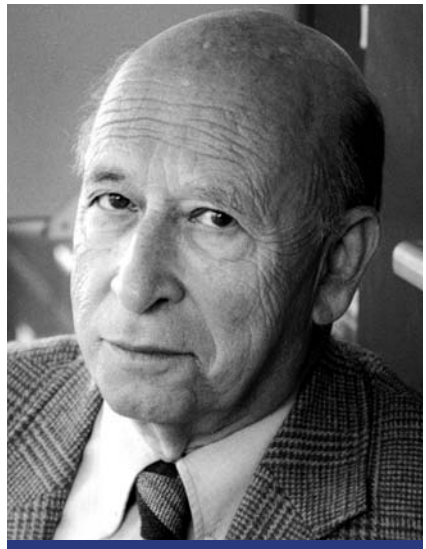
In 1946 Val moved to ETH Zürich for graduate study in Paul Scherrer's group. His observation of so-called three-pronged stars, corresponding to the reaction $\gamma + C \rightarrow \alpha + \alpha + \alpha$, deeply impressed Scherrer. Though offered a position at the University of Bristol by C. F. Powell, Val chose to go to the University of Chicago, where he caught the tail end of the Fermi years.

In line with his broad interests in physics, Val, together with one of us (Gell-Mann) who was a guest in Val's Chicago lab at the time, published a paper on charge independence in nuclear reactions involving photons, relating to the work on isospin selection rules by Luigi Radicati.

The 1956 parity revolution put Val on the map as a major player in particle physics. The University of Chicago experiment by Val and Jerome Friedman on parity violation in the $\pi \rightarrow \mu \rightarrow e$ chain is one of the three independent and almost simultaneous experiments that vindicated the bold idea of T. D. Lee and C. N. Yang that parity conservation is violated in weak interactions. A lot of acrimony was connected with the time-ordering of those three independent and brilliant experiments. The Columbia University–National Bureau of Standards collaboration led by Chien-Shiung Wu and the Columbia team of Richard Garwin, Leon Lederman, and Marcel Weinrich were the first to publish. An editorial decision was made to publish the Telegdi–Friedman letter in the next issue of the journal in question instead of the issue containing the Columbia letters. At the time of the parity experiment, there was close scientific contact between Val and one of us (Oehme), who discovered that charge-conjugation symmetry must also be violated in the experiments.

The field was now moving fast, and once the so-called V–A theory of the weak interactions had been proposed, it became essential to accurately measure the ratio of the Gamow–Teller and Fermi matrix elements in neutron beta decay. A classic experiment by a University of Chicago–Argonne National Laboratory collaboration led by Val found the value 1.25 for this ratio.

A fundamental CERN experiment led by Val and Garwin in 1959–60 measured the muon's anomalous magnetic moment and provided one of the most stringent tests of quantum electrodynamics. Val Telegdi, Valya Bargmann, and Louis Michel constructed the elegant, and in this context very useful, relativistic theory of the precession of the spin of a charged particle moving in a homogeneous electromagnetic field. In the latest version of this muonic "$g-2$" experiment, parts-per-million accuracy has been reached.



Valentine Louis Telegdi

Among Val's other important experiments were ones on K_S regeneration, muonium, and the helicity of the muon neutrino. He also worked on muonic atoms, a field in which Wu, Val's erstwhile competitor, was also active. That shared research interest further fanned the flames of an outright Telegdi–Wu feud, which was fought with etiquette that would have passed muster at the courts of both the Hapsburg and the Qing emperors, and yet was as harshly antagonistic as feuds between great scientists can get.

In 1976 Val left the University of Chicago, where he had been the Enrico Fermi Distinguished Service Professor of Physics, for a professorship at ETH Zürich. Val was elected to the CERN Scientific Policy Committee and soon became its chairman. In that capacity he was instrumental in starting a collaboration between CERN and Russia. Over the past two decades, he spent much time first at Caltech and then at the University of California, San Diego.

For his major contributions to standard-model physics, Val was elected to the national academies of the US, Sweden, Hungary, and Russia; to the Royal Society in London; and to the Accademia dei Lincei in Rome. In 1991 he shared the

Wolf Prize with Maurice Goldhaber, one of his few peers in putting keen theoretical knowledge to work in devising very clever experiments.

A charismatic lecturer, Val streamlined his arguments to the point that their conclusions appeared both inescapable and natural. He would sprinkle his lectures with marvelous aphorisms, such as "Last year's sensation is this year's calibration and next year's unwanted background" and "It is easy to be a child prodigy, but much harder to be an adult prodigy." Val was a demanding teacher, but he knew how to nurture talent.

Val viewed humans in a straight black-and-white fashion, with hardly any shadings, a trace maybe of the old Austro-Hungarian "K.u.K." dual-monarchy mentality impressed on him in his childhood. That perspective is largely the reason for the feuds he managed to get embroiled in. His wife Lia (generally recognized as by far the greatest chef in the western physics community) once asked Gell-Mann, "In physics is it really necessary to hate as many people as Val does?" He replied, "To tell the truth, I don't know, but if it is a comfort to you, in many cases Val somehow knows how to pick the right people to hate."

But Val was also capable of friendship in the truest sense of the word, and those who benefited from Val's giving friendship cherish it as one of the great things to come their way in life.

The physics community has lost a supremely original master at a time in which large amorphous collaborations are necessarily the rule, and individualistic perfectionists of Val's caliber have become extremely rare exceptions. It is a great loss indeed.

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