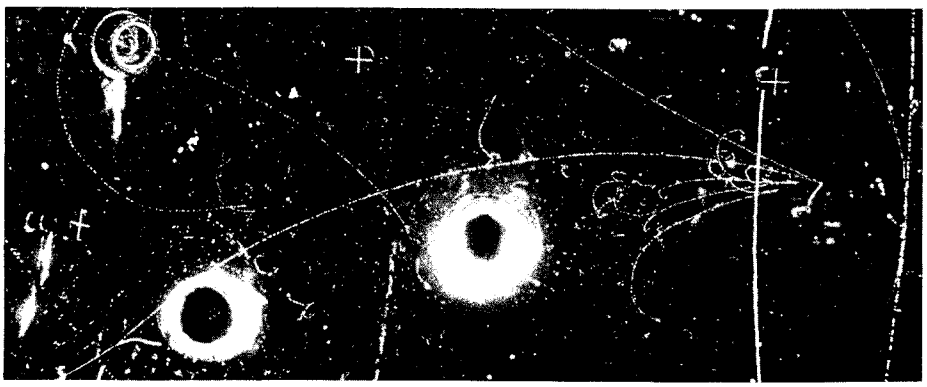
providing added value to the data sample.

Z physics has come a long way since May 1983.



Ten years of searching preceded the discovery of the neutral current at CERN in 1973.

Thirty Years of Weak Neutral Currents!

Twenty years ago at CERN, a new form of interaction, the neutral current, was discovered. However for the preceding ten years physicists already had been searching for variants of this interaction, so a symposium held on February 3-5 by the Pacific Ocean in Santa Monica, California reviewed a total of thirty years of neutral current research.

The meeting began with an overview of the development of the understanding of weak interactions from the 1930s to 1950s. Laurie Brown (Northwestern) led this discussion, which was followed by a tribute to the milestone accomplishments of the late Ben Lee and J.J. Sakurai (UCLA).

In the Weak Neutral Currents (WNC) discovery, neutrinos were seen to interact with target particles but still continued on their way as neutrinos. This was the first time that the weak interaction had revealed a disdain for electric charge - previously all weak interactions had been seen to permute the electric charges of the participating particles. It opened the door to new synthesis and un understanding.

The discovery had followed a decade of careful search, in which one major target had been Flavor Changing Weak Neutral Currents (FCWNC) - in which neutral current interactions would be accompanied by transitions of the strange quark. David Cline (UCLA) looked at the initial unsuccessful attempts to detect WNC at Brookhaven and CERN in the 1960s and the early search for FCWNC.

The absence of strange quark transitions set the stage for the introduction of a fourth quark ('charm') - the GIM mechanism - and the subsequent emergence of the Standard Model.

The era of the WNC discovery in 1973 was described by science historian Peter Galison (Harvard). Dieter Haidt (DESY) represented the Gargamelle Collaboration at CERN credited with the discovery, while Al Mann (Penn), representing the Harvard-Penn-Wisconsin-Fermilab (HPWF) collaboration, put the observations in the context of Fermilab's appearance on the physics scene, with a new detector in an unexplored neutrino energy range.

Lively discussion between the audience and members of the Gargamelle and HPWF groups recalled the experiences of 1973. Paul Langacker (Penn) gave an overview - "The Five Phases of Weak Neutral Currents."

Sid Bludman (Penn) described the first gauge theory of weak interactions as well as the success of the Weinberg-Salam-Glashow model. Nicola Cabibbo (Rome) described the early days of quark mixing, recounting how he came to invent the first quark mixing theory. His talk was followed by George Snow (Maryland) recounting early data from hyperon decays and the then new Cabibbo model.

In 1974 came a seminal paper on charm by Ben Lee, Marie K. Gaillard and Jon Rosner. Two of the authors were at Santa Monica: Marie Gaillard (Berkeley) described a model of strong WW interactions, while Jon Rosner (Chicago) spoke on the current status of mass constraints on the sixth ('top') quark.

The meeting then changed direction to discuss the implications of neutral currents in astrophysics. David Schramm (Chicago) and James Wilson (Livermore) explained how supernovae explode, while George Fuller of San Diego looked at how supernova data can restrict electron-neutrino/tau neutrino mixing.

For the arrival on the scene of proton-antiproton colliders and the discovery of the W and Z particles at CERN by the team led by Carlo Rubbia, Andy Sessler (Berkeley) gave a beautiful review of the history of colliding beams concepts from invention (1957) to the idea of stochastic cooling by Simon Van der Meer (1968). A review and discussion of the development of the proton-antiproton colliders at Fermilab and CERN and the important discoveries at CERN was led by

Twelve years at DESY

David Cline - reviewing thirty years of neutral current research.

D. Cline. The discussion centred on why Fermilab failed to get the early collider programme started, thus failing to compete for the big discoveries, and the brilliant CERN accelerator team that made the proton-antiproton collider a reality.

An interlude was speculation on the role of neutral currents in a possible connection between the chirality (left-right handedness) of life. Dilip Kondepudi (Wake Forest) presented an interesting study of the mechanism by which a small symmetry breaking WNC interaction in the prebiotic period on earth could be amplified into the full chiral symmetry breaking observed in all life forms. Hangyo Wang (UCLA) showed new simulations on the same theme.

Carl Wieman (Colorado) surveyed the past and future of atomic physics parity violation measurements. These beautiful table-top experiments will soon provide new precision in this field.

Sandip Pakvasa (Hawaii) recalled the confusion and developments during the period 1974-1978 until the Standard Model was finally established. Robert Burman (Los Alamos) described neutral current studies with low energy neutrino beams and the observation of W/Z interference effects.

Turning to the future, Vernon Barger (Wisconsin) peered beyond the Standard Model, emphasizing the phenomenology of supersymmetry, and Mark Ito (Princeton) described past and future searches for new decay modes in K decays. Ahmed Ali (DESY) looked at the b quark sector and the observation of neutral B meson mixing by UA1 and ARGUS.

Participants enjoyed the informal discussion and informed recollections of an exciting period in particle physics, a period when small groups of scientists made major breakthroughs, a contrast when imminent experiments at the SSC and LHC will involve groups of 500 to 1000 people.

The proceedings of the meeting, published by American Institute of Physics, will be edited by D. Cline and A.K. Mann.

From David Cline (UCLA)

Historic picture by Pedro Waloschek of all the Chairmen of DESY's Board of Directors since the foundation of the Hamburg Laboratory in 1959. Left to right - Herwig Schopper (3rd), Wolfgang Paul (2nd), Willibald Jentschke (founding), Volker Soergel (retiring), Bjorn Wiik (current).

As reported in our previous issue (page 27), on 28 February Volker Soergel stepped down after serving as Chairman of the Board of the DESY Laboratory in Hamburg since January 1981, when the previous chairman, Herwig Schopper, moved to become Director General of CERN. DESY is now headed by Bjorn Wiik.

During the twelve years of Soergel's mandate, DESY substantially evolved and progressed. Dominating the landscape was the big HERA electron-proton collider - the world's first - proposed, approved, constructed and commissioned under Soergel's leadership. As well as pioneering electron-proton collisions, HERA also broke new ground in international collaboration. At the approval of the project by the German government, it had already been made clear that both the machine and its experiments had to be built with full international cooperation, using material contributions from foreign institutes. With the difficult task of transforming these require-