Lepton, Photon Symposium, Fermilab, 1979

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Proceedings Of The 1979 International Symposium On Lepton And Photon Interactions At High Energies

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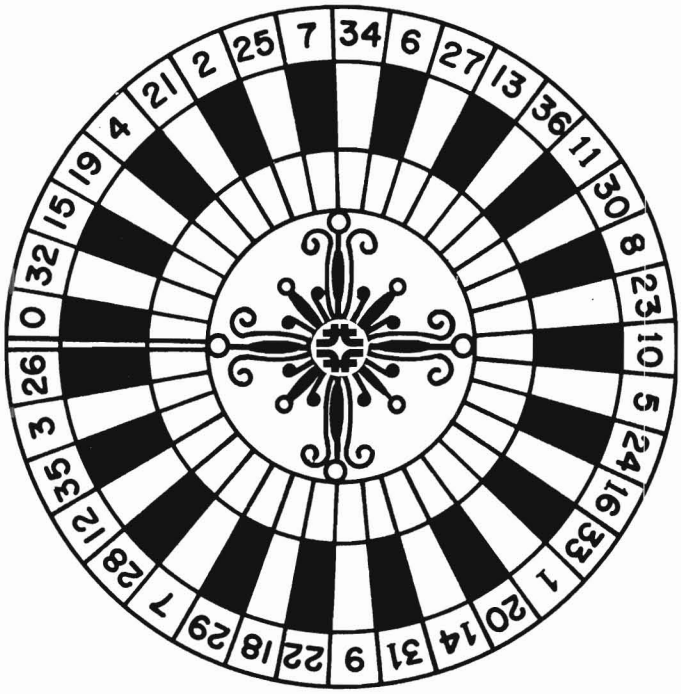

Fermi National Accelerator Laboratory
Batavia, Illinois

1979 International Symposium on
Lepton and Photon Interactions at High Energies
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FOREWORD

This symposium on Leptons and Photons is ninth in the series of biannual meetings which began at Cambridge, Massachusetts, in 1963. Looking back to that time it was already clear that the rapid proliferation of hadron resonances had destroyed the notion that the proton or the pi meson was in any way elementary. In subsequent years, attempts were made to search for the constituents of hadrons. While no direct search has been successful, indirect evidence has accumulated to show that there are point-like constituents within the hadrons. This evidence did not come as a single blinding revelation but rather through the gradual accumulation of experimental detail.

Quantum Chromodynamics, a theory of quarks and gluons, has emerged as the theory which is consistent with what is known about hadrons. At this year's symposium the first evidence for the reality of gluons was presented through the analysis of data from the PETRA experiments. Data from new measurements of deep inelastic lepton scattering on hadrons and from dilepton pair production in hadron collisions were presented which showed satisfying consistency with QCD calculations. The progress made on theoretical calculations of these reactions was sufficiently encouraging to let one hope that by the next conference QCD will be near to gaining the stature of QED.

No sooner had the quark acquired sufficient experimental reality to be called an elementary particle than its elementarity has been called into question. Theoretical work was reported on grand unification schemes which suggest that quarks and leptons are made of the same stuff. The death of the proton, the most solid member of the family of particles, appears to be an almost inescapable consequence of the unification scheme. It is fair to say that the future promises we will soon understand what we already know and what we don't yet know will contain many exciting surprises.

John Peoples, Jr., Chairman
Symposium Organizing Committee

ACKNOWLEDGMENTS

The success of the 1979 Lepton Photon Symposium at Fermilab and especially the credit for rapid publication of the Proceedings is a direct result of the dedicated efforts of the speakers, their scientific secretaries, and the non-scientific support staff. As editors, we would like to take this opportunity to express our thanks to each of these groups.

First, we wish to thank the speakers whose talks in both spoken and written versions met or exceeded our expectations. We are especially grateful that all the speakers managed to meet the challenging publication deadline we set, while maintaining the quality of the papers in form and content.

To the scientific secretaries, our thanks go, along with the gratitude of the Organizing Committee for their helpful assistance to the speakers and to the Organizing Committee during the symposium and for their careful reading of the submitted manuscripts afterwards. If the published papers are more free of syntactical and typographical error than most, the credit goes largely to the scientific secretaries for their careful proofreading.

We are especially grateful to the Fermilab technical and secretarial personnel who worked so well together to make the symposium a logistical and esthetic success, as well as a scientific one. Particular thanks go to Helen Peterson for her superb overall organization, to Anne Burwell whose computer record keeping smoothed many details, and to Mary Fisk, Barb Kristen, Laura Sedlacek, and Claudia Slater who turned in enormous amounts of organizational and secretarial work during and after the symposium as well as in the production of this volume.

The efforts of Rene Donaldson and Angela Gonzales to make this book so promptly and so well are appreciated by the editors who stand in debt as well as in awe of the superb work that was done with the design of the book, its organization and typography, and the logistics of its printing.

Finally, our thanks go to the International Union for Pure and Applied Physics, the United States Department of Energy, the United States National Science Foundation, and Fermilab, without whose support there could have been no symposium.

T. B. W. Kirk
H. Abarbanel
Proceedings Editors

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AT HIGH ENERGIES

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