

Quarks and leptons

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Quarks and Leptons: the New Elementary Particles?: Proceedings of a Royal Society Discussion Meeting held on 14 June 1985 /Eds. R. H. Dalitz, F. R. S., P. I. P. Kalmus. The Royal Society, London; Cambridge University Press, Cambridge, 1986, pp. 148.

During the last two decades quarks and leptons have become firmly entrenched as "fundamental components of matter" and have become so popular that, one might say, not a single article on particle physics can do without these concepts, and it becomes hardly possible to keep track of all the conferences and symposia devoted to them. Nevertheless I would like to call our readers' attention to the fact that the materials of the discussion held at the Royal Society of London on 14 June 1985 devoted to quarks and leptons have been published as a separate book. They were earlier published in the "Proceedings of the Royal Society of London, Ser. A" (V. 404, No. 1827, p. 149, 1986). Within the closely confined form of eight reports are contained reviews of the

history and the present state of the concepts of quarks and leptons (F. E. Close), of the manifestation of quarks and gluons in the form of jets (R. Marshall), of the physics of intermediate bosons (A. G. Clark), of lepton-hadron interactions (D. H. Saxon), of the grand unification physics (J. R. Ellis), of new results from the CERN collider (J. D. Dowell), of the search for new properties of particles with the aid of huge underground detectors (T. W. Jones), and of the problems of new accelerators and future experiments (P. I. P. Kalmus). Regarded as a brief listing of the principal problems of the physics of quarks and leptons and of their interrelationship the book will turn out to be useful for specialists as a brief reference work, and for the nonspecialists in helping them in choosing problems and references to the literature devoted to some particular topic. Historians of science can also utilize it in studying this exciting stage in the development of high energy physics.

Coherent radiation sources

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Coherent Radiation Sources/Eds. A. W. Sáenz and H. Überall. Springer-Verlag, Berlin; Heidelberg, New York; Tokyo, 1985, pp. 235. (Topics in Current Physics. V. 38).

This book is a collection of articles devoted to the production of electromagnetic radiation when fast charged particles travel in crystals and across an interface between two media. In the first article (A. W. Sáenz and H. Überall) a brief discussion is given of the theory of coherent bremsstrahlung: its kinematics, its theory in the Born approximation, the results of numerical calculations for specific cases. The second article (G. D. Kovalenko, L. Ya. Kolesnikov, and A.L. Rubashkin) is devoted to the experimental study of coherent bremsstrahlung. A description is given of the experimental arrangement for such experiments and the results are discussed of experiments on measuring the frequency distribution, the dependence on orientation of total intensity, of the polarization of the radiation and of the prop-

erties of the radiation at low electron energy.

Channeling in a bent crystal is discussed in the article by R. A. Carrigan, Jr. and W. M. Gibson. The foundations of the theory are stated and various applications are discussed including the extraction of the beam from the accelerator and the focusing of beams.

The classical theory of radiation accompanying channeling is discussed in the article of V. V. Beloshitkiĭ and M. A. Kumakhov including radiation accompanying plane and axial channeling and comparison with bremsstrahlung.

The article of J. V. Andersen, E. Bonderup, and E. Laegsgaard is devoted to the quantum theory of radiation from charged particles accompanying channeling. Radiation in the cases of plane and axial channeling, the damping and line width, the effect of thermal scattering and applications are discussed.

The article of B. L. Berman and S. Datz is devoted to