

at the highest energies available in the laboratory, then a number of things can happen, as indicated in fig. 13. The best way to produce such collisions is in high-energy electron-positron storage rings. Figure 14 shows an example of such an installation at SLAC.

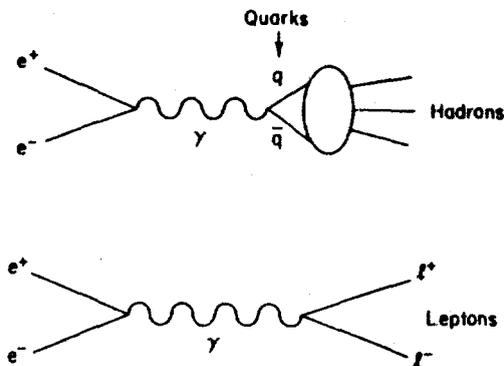


Fig. 13. Diagrammatic representation of electron-positron annihilation resulting in final hadrons (strongly interacting particles) in the upper diagram and final lepton pairs (not subject to the strong interaction) in the lower diagram. Since hadrons are composed of mixtures of quarks, the primary process in the upper diagram is creation of quark pairs via electromagnetic interaction carried by the intermediate photon γ . Hadrons are then produced subsequently through forces between the quarks. In contrast, in the lower diagram it is shown that leptons are produced through a purely electromagnetic process.

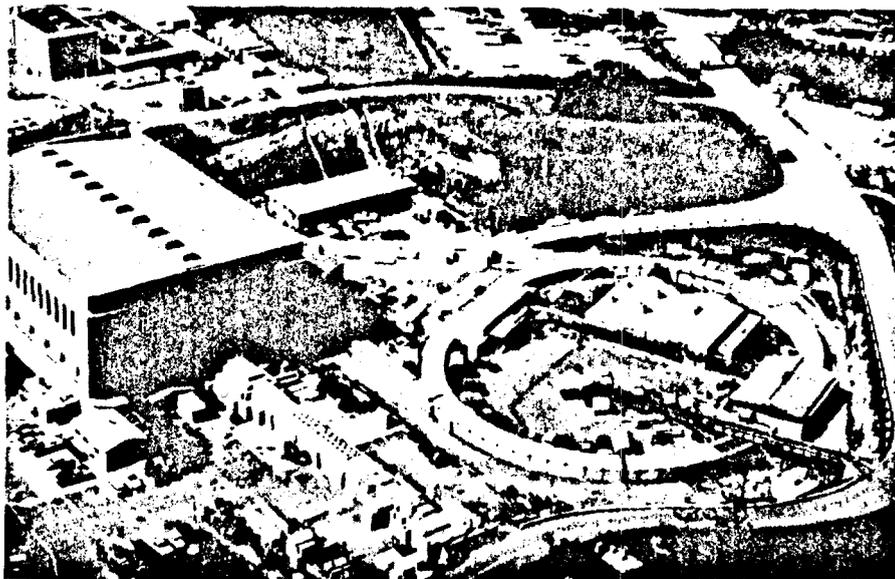


Fig. 14. Aerial photograph of the housing containing the SLAC electron-positron colliding beam storage ring SPEAR. The two buildings lying within the ring house the apparatus for detecting the results of electron-positron annihilation.