I. INTRODUCTION

The rapidly increasing family of hadrons (strongly interacting particles) and the complexity of their interactions manifested through the vast amount of data presently available constitutes a rather awesome picture. Attempts to bring some semblance of order into this situation has led to a great variety of ideas and tentative theoretical approaches. Before hoping, with any reasonable degree of optimism, for a 'final theory of elementary particles' it is clearly necessary to establish, clarify and test the contents of the various approaches and also to correlate apparently different, useful and promising approaches.

In recent times two such major approaches have proved to be useful - the Symmetry approach and the Dynamical approach. In the Symmetry approach the hadrons are grouped into multiplets of some internal symmetry group and in this regard the Eight-fold Way in the SU(3) symmetry scheme has proved particularly efficacious. In the same category belongs the hypothesis of Universal Coupling of Vector Mesons to Hadrons. On a deeper level the symmetry approach has led to the Algebra of Current Operators. In the Dynamical approach the traditional techniques, namely, perturbation methods in Quantum Field Theory are suspect in view of the largeness of the strong interaction coupling constants. However, the appreciation of the importance of the analytical
structure of the scattering amplitude, and the inception of Dispersion Relations and the Mandelstam Representation, together with the consideration of Regge Asymptotics ushered in a new and fruitful era in the development of hadron dynamics.

The object of this thesis is to reexamine the dynamical approach in the light of the developments in the symmetry approach, in the concrete context of kaon-nucleon scattering. For this purpose, in Section II of this thesis entitled Preliminaries, the kinematics, isospinology, analyticity and partial-wave expansions for meson-baryon scattering are discussed. Section III is devoted to the implications, in low energy kaon-nucleon dynamics, of the current algebra calculation of kaon-nucleon scattering lengths, and the various coupling constants discussed in view of the SU(3) symmetry scheme. Section IV is concerned with the use of a threshold identity in the framework of dispersion relations to examine on the one hand the hypothesis of the universality of \( \phi \)-meson coupling to hadrons and the use of SU(3) symmetry for kaon couplings to baryons on the other. Section V is devoted to concluding remarks. The relevant results of SU(3) symmetry, an outline of the current algebra approach to KN scattering lengths, an account of the vector meson dominance and the hypothesis of universal \( \phi \)-coupling, and a detailed derivation of the various contributions to the invariant amplitudes are relegated to Appendices I, II, III and IV, respectively.