c) See J. L. Rosner, "The Classification and Decays of Resonant Particles" SLAC-PUB-1391, 1974 (submitted to Physics Reports).

d) B. Hyams et. al., AIP Conf. Proc. 13, 206(1973) and Nuclear Physics (to be published).

e) G. Grayer et al., AIP Conf. Proc., 13, 117 (1973).

f) The two-pole hypothesis is also advocated by Y. Fujii and M Fukugita (Paper 992). A radically different analysis of the $0^+$ nonet requiring a narrow $\kappa$ at 900 MeV has been given by G. Conforto (2nd International Winter Meeting on Fundamental Physics, Formigal, Spain, 1974).

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# CONCLUDING REMARKS

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Since the last International Conference in this series, significant progress had been made in describing the particle spectrum and resonance decay properties. As repeatedly emphasised in the contributions of A Hey, S Meshkov and J Rosner to these proceedings, the so called Melosh transformation between constituent and current quarks is at the origin of the recent successful parametrisations of pionic decays and of photoexcitations of resonances.

It seems appropriate, at this stage, to comment briefly on some features of this transformation which in my opinion are worth emphasising:

- the simple algebraic structure of the transformed axial and vector currents (eg $VQ_{5i}V^{-1}$) which has been abstracted from the free quark model, could very well be an exact property of the "good" components of these operators.

- to go beyond naive algebraic considerations, "bad" operators such as the mass operator, for example, must be included into the scheme. The algebraic structure of these operators is still an open question. In this respect, it is worth pointing out that a careful analysis of resonance electroproduction or resonance decays involving vector mesons will provide information on at least one class of bad operators namely the transverse components of the electromagnetic current (in the case of hadronic decays involving vector mesons one has of course to use vector dominance).

- in a light like formulation bad operators such as the mass operator and the transverse components of the angular momentum operators contain the dynamics of the theory. Relativistic covariance imposes a series of complicated algebraic equations relating these operators and the vector and axial vector current densities (the so called angular condition of Dashen and Gell-Mann). The problem of constructing a Melosh transformation in a theory with local currents is then essentially equivalent to solving the angular condition within a representation of current algebra. Let me point out that the algebraic properties of current operators, which work so well phenomenologically are equivalent to those of "single quark" operators as explicitly shown by Lipkin. From a dynamical point of view this can only be meaningful if, for example, $q\bar{q}$ like representations of local current algebra for the mesons exist. No such representations, except for the free quark case, have been found up to now.

- in the present formulation of resonance decays, the pion plays a very peculiar role indeed: it is sometimes viewed as a simple constituent object and sometimes, through PCAC, as a simple current like object (ie a pole in the divergence of the axial current). How to make these complementary uses of the pion logically consistant is still unclear. An interesting approach to this problem has been suggested in a recent paper by R Carlitz and W K Tung (Chicago preprint EFI 74/19).

- as a last comment on "Resonance Models", it is worth repeating that, as reported in J E Mandula's contribution to these proceedings there exist at least two classes of models (the so called permanently bound quark model and the bag model) which take the problem of quark confinement seriously enough to impose ab initio that quarks cannot escape from hadrons. The spectrum has been computed in simplified versions of both these models. Despite some remarkable features such as indefinitely rising Regge tajectories, the spectrum of the bag model, at least in its present form, is far too rich to be realistic.