VELOCITY DISPERSIONS IN CLUSTERS OF GALAXIES

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31 redshifts have been obtained for A1367, 34 for A262 and 61 for the Centaurus cluster (HMS 1247-4102). Full details of this work have been and will be presented in M.N.R.A.S. Both A1367 and A262 are spiral-rich in Oemler's classification, while Centaurus is intermediate in type between spiral-rich and poor. In all 3 cases, the distributions of E and L galaxies are centrally concentrated, whilst the spirals are distributed in a more extensive and ragged fashion. The mean corrected redshifts and velocity dispersions for 2 morphological subsets are given in Table I. There is no significant difference in the mean velocities of the 2 subsets for each cluster. However, the velocity dispersions for the spirals are significantly greater than those for the E,L galaxies in both A1367 and A262. The differences in velocity dispersions of the 2 subsets for Centaurus are not statistically significant. Gott and Gunn have suggested that irregular clusters of the sort presently described have not undergone collapse. However, all 3 clusters show morphological separation and are x-ray sources. This is consistent with a collapsed core surrounded by a shell of infalling spirals. The x-ray emission may be produced by a thermalized gas cloud entrapped at the core, which transmutes into a L any spiral so unwise as to plough through it. A262 and Centaurus have resolved sources of x-ray emission. We have taken a sample of 9 x-ray clusters (A262, Vir, Cen, Coma, Per, A2256, A2199, A1060, A1367) with known extents or upper limits to their extents (Kellogg & Murray 1974) and fitted a relation of the form

$$Lx \propto \Delta v^n R^m \exp(-A/\Delta v^2) \quad \text{(R, size of x-ray core)}$$

We find best fit values of n=3 and m=1 (for $A \ll 10^6$ km^2 s^{-2}) with uncertainties of ±1 in both indices. An inverse proportionality between Lx and R is most unlikely and yet most models for the x-ray emission demand such an inverse proportionality. One exception is the galactic wind model of Yahil and Ostriker (1973) which predicts the same values as we have given for n and m; Kellogg & Murray also pointed this out using a smaller data set of 4 cluster x-ray sources.

Table I

Name	Number of Galaxies		Mean Velocity		Observed Velocity Dispersion	
	n(E,L)	n(S)	$\bar{v}$(E,L)	$\bar{v}$(S)	σ_v(E,L)	σ_v(S) km s^{-1}
A1367	18	15	6430	6630	586	845
A262	17	17	4950	5090	289	543
Cen	41	20	3240	3330	920	780

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