the context C_k will be those which can be expressed as follows: $W_k = \Sigma_j w_j^k P_j^k$, where for all j and all $m_i \in m_k$, $Tr(P_i^k M_i) = r_l^i$, M_i being the operator corresponding to m_i, and r_l^i being the l'th eigenvalue of M_i.

We now have the following theorem:

<u>Theorem</u>: Assume that m_k is a set of compatible observables determining an experimental context C_k, and that $W_{qm} = \Sigma_n w_n P_n$ is the state which the ordinary rules of quantum mechanics assign to an ensemble E whose behavior in C_k we want to study. The P_n are projections onto a set of one-dimensional subspaces of the Hilbert space of E, that is, $W_{qm} = \Sigma_n w_n |\emptyset_n\rangle\langle\emptyset_n|$. For every such context and every such state W_{qm} there exists a state W_k appropriate to the context C_k which exactly reproduces the statistics of W_{qm} for every observable $m_i \in m_k$; that is, there exists an appropriate state W_k such that for every operator M_i corresponding to an observable $m_i \in m_k$, $Tr(W_k M_i) = Tr(W_{qm} M_i)$.

<u>Proof</u>: Since all of the $m_i \in m_k$ are compatible, all of the corresponding M_i commute, and thus there exists a complete orthonormal set of simultaneous eigenvectors of the M_i. Let $\{|\psi_j^k\rangle\}$ be such a complete orthonormal set. If M_s is the operator corresponding to an observable $m_s \in m_k$, let $M_s = \Sigma_j a_j^s |\psi_j^k\rangle\langle\psi_j^k|$ be the spectral representation of M_s in terms of the basis $\{|\psi_j^k\rangle\}$, and let $|\emptyset_n\rangle = \Sigma_j c_j^n |\psi_j^k\rangle$ be the expansion of