

CHAPTER - VI

CONCLUDING                      REMARKS

C H A P T E R - V ICONCLUDING REMARKS6.1 PRELIMINARY REMARKS.

In this concluding chapter, we comment very briefly and critically on the entire work of this thesis in the section 6.2. The limitations of the view points and methods adopted in the entire discussion are pointed in short in the section 6.3. The problems which arise as the extensions of the present work or related to it will be mentioned at the end, i.e., in the section 6.4.

6.2 CRITICAL COMMENTS.

The entire development of this work deals with simple and essentially statistical models, though in some portion it is based on the probabilistic approach and in some part information theoretic approach is taken into consideration.

The extension of the entire discussion from equilibrium processes to non-equilibrium processes are very simple conceptually and mathematically.

Moreover, extensions of discussions from linear theory of non-equilibrium processes to non-linear theories for them are also direct and easy.

The emergence of covariances and correlations in a very significant manner in the theories for non-equilibrium processes in the present work gives a clearer insight, of course qualitative, in the significance of the important results like the Onsager reciprocal relation etc.

The introduction of a new parameter different from those involved in probability distribution is based on a general consideration, and as such claims its wide applicability. The association of the same with different quantities involved in the mathematical theories to physical sciences, manifest the nature of different types of changes occurring in the system under consideration. Particularly, the results obtained on the identification of the parameter separately with time and some spatial coordinates ensure a significant analogy between the phenomena of irreversibility and inhomogeneity occurring in the system.

Also in the present work, the new method for calculations of fluctuation is simple and mechanical.

### 6.3 LIMITATION.

In the entire work, the forms of the statistical distributions used for non-equilibrium processes are the same as those

used in the equilibrium processes. This signifies that the changes occurring in the system is so small that the statistical nature of the system under consideration does not change, only there are some dependence of the parameters on time. This assumption is quite similar to those of the principle of adiabatic invariance of thermodynamics and of quantum mechanics.

#### 6.4 EXTENSIONS AND RELATED PROBLEMS.

To extend the statistical methods, discussed here, to the problems concerning the changes of different basic variables in non-equilibrium processes, this theory should be based on the equation like Plank-Fokker equation where the distributions of equilibrium processes will be the initial values. This problem appears to be promising but difficult. Here, of course, one should examine the conceptual basis initially.

In the models, used in the present work, exponential distributions are the starting points. What will be the corresponding development, if some other plausible distributions be taken as the starting point, is worthy of future investigation.

The dependance or the association of the changes in the coefficients of correlations among the basic entities existing in the system with the changes (of state) occurring in the system is also a point of discussion.