Introduction

The *Journal of Statistical Physics* is an international journal concerned with the publication of material dealing with the application of statistical methods to the solution of problems in the physical, biological, and social sciences. The word "physics" appearing in the name has a historical basis; the initial steps in assembling the Journal were taken by individuals who thought of themselves as physical scientists. However, the viewpoints of the initial organizers were soon expanded to encompass the idea of an interdisciplinary journal which would not only accept papers from a variety of fields of specialization but which would actively encourage, and in fact invite and commission, articles aimed especially at interface problems. Furthermore, it is hoped that significant dialogue between the disciplines will be stimulated through vigorous action on the part of the Journal's Board of Editors.

Interdisciplinary activity may occur in a number of ways. One case occurs when the same language is employed by different groups for both the description and solution of different problems. An example is the correspondence between the *transmission line* theory employed by electrical engineers and the quantum-mechanical theory of *electrons in periodic lattices* used by solid state physicists. Another example may be the correspondence between *matrix mechanics* as employed by physicists and the *state space* technique utilized by control theorists. A second kind of correspondence occurs when the *same* problem is attacked using *different* languages. An example may be the relation between problems of controllability and observability in control theory and the question of the origin of *irreversibility* in statistical mechanics.

The examples quoted are drawn from the fields of physics and engineering, but it is almost certain that similar correspondences exist between both of these fields and, for instance, mathematical economics. In any event, it is hoped that the Journal will facilitate the illumination of such correspondences whenever and wherever they occur.

Of course, high-quality papers lying entirely within any one of the relevant disciplines will also be accepted.

As a rule, articles dealing with original research, reviews, notes, and even letters concerned with unresolved paradoxes (these to be published in a special department) will appear in the Journal. Areas of interest are the following: (1) mathematical and physical foundations of statistical mechanics; (2) application of statistical mechanics to specific real systems, including both stellar systems and plasmas; (3) noise and fluctuation phenomena; (4) experimental papers dealing with the *foundations* of

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statistical mechnics (third-law experiments, for example); (5) kinetic theory of transport phenomena; (6) kinetic theory of neutron transport and thermalization; (7) chemical rate theory; (8) biological rate processes; (9) nucleation and the kinetics of phase transformation; (10) application of stochastic methods to chemical, physical, biological, and engineering problems; (11) pattern recognition; (12) urban problems (traffic control, waste disposal, air pollution, etc.); (13) new mathematical methods in statistics and stochastics; (14) operations research; (15) mathematical economics.

In this, the first issue, three papers have been specially prepared to focus on interface problems. These are the articles by Meecham, Reiss, and Richardson, which deal respectively with the use in statistical mechanics of methods drawn from pattern recognition, the use in information theory of methods drawn from statistical thermo-dynamics, and the application of stochastic methods used in the theory of turbulence to problems outside the field of fluid flow.

In the first issue the Questions and Answers Department is opened, and the scientific public is invited to submit questions to the editor for publication in future issues.

During the first year, the Journal will appear on a quarterly basis. If in later years the demand merits it, it will be published more frequently.

H. Reiss
Editor-in-Chief