BOOK REVIEW – BUCHBESPRECHUNG

István Gyarmati: Nonequilibrium Thermodynamics (Technical Editor, Budapest, 1967, in Hungarian)

The book of I. Gyarmati is the first work published in Hungarian concerned with the exact treatment of nonequilibrium thermodynamics. Initial chapters of the book develop thermodynamics as an application domain of the field theory. Such a development of thermodynamics is the necessary condition of giving the model of the general theory of continua. The first chapter of the book is giving the fundamentals of such a viewpoint. In the second chapter the total system of the balance equation of the classical field theory is dealt with both in local, and in substantial form. This chapter presents a complete derivation of balance equations of the multicomponent superposed continua. In the third chapter the general treatment of nonequilibrium thermodynamics is given for multicomponent and reacting hydrothermodynamic systems. In the fourth chapter the properties of nonequilibrium potential functions (dissipation functions) are investigated and the Onsager principle of the least dissipation of energy is given. This principle is a variational principle equivalent to Onsager's linear theory, presented in a general form corresponding to the fundamental equation of the developed field theory and also the alternative forms of the principle recognized recently are described. In the fifth chapter the principle of the minimum entropy production is treated. The principle of the minimum entropy production is demonstrated to be an alternative formulation of the Onsager principle valid for the stationary states, rather than an independent principle.

On the basis of the variational principle valid for stationary states the general theory of such states is given. In Chapter Six the Fourier equation of the heat conduction, the total set of the Fick equation of multicomponent isotherm diffusion as well as the Navier—Stokes equation of viscous flow is derived from the force representation of the principle of least dissipation of energy. The derivation of these equations permits to formulate a new integral principle of thermodynamics, to be called the "Gyarmati principle". The Euler—Lagrange equations pertaining to the integral principle are equivalent to the total set of transport equations. As a direct application of the integral principle, different transport equations are derived, leading to different equations describing nonisoterm and cross effects. The relation between the integral principle and the Hamilton principle is cleared up and the canonical and field equations pertaining to the integral principle are determined. Finally the dissipation potentials and the Legendre transformations of the dissipational Lagrangian and Hamiltonian densities are presented and the canonical form of the dissipation integral is given. The book is fundamentally developed for linear problems, i.e. for the case of quadratic dissipation functions of the Rayleigh type but also the directives for the generalization for non-linear systems are displayed. Gyarmati's book excels the modern books on thermodynamics by its rigorous logical build-up and its new achievements.

J. SÁNDOR

Herrmann J.: Lehrbuch der Vorratspflege. Haltbarmachen, Frischhalten und Lagern von Lebens- und Futtermitteln (Textbook of Preservation. The Conservation, Preservation and Storage of Foods and Feeding Stuffs), VEB Deutscher Landwirtschaftsverlag, Berlin, 1963

This very imposing volume gives much more knowledge than can be assumed from its title; it represents a concise summary of food chemistry and technology connected

with the preservation, conservation and storage of edible commodities and feeding stuffs. The near 1000 pages of the textbook are dealing — in two well-distinguished

parts — with the basic facts of food chemistry and with the special problems of preservation-and conservation-industry. Accordingly in the first part of the textbook a short introduction to biochemistry, biophysics, and microbiology can be found in connection with the composition of food and fodder, a very good account of the changes occurring during the storage of vegetable and animal products, methods for the prevention of the disadvantageous alterations, and finally the description of the fundamental methods and processes of preservation and conservation. In these chapters physical, chemical and biological methods, their theory and practice are fully dealt with. The second part of the textbook is dedicated to the special requirements of various branches of food- and food-preserv-

ing and conserving industry: among others methods of preservation for green-fodders and oil seeds, vegetables, fruits, vegetable and fruit-products, tobacco, spices are given. Furthermore the practice of keeping fresh eggs, milk, dairy products, animal carcasses and various kinds of meat, fish and sea-food are shown. Although the book was written mainly for students of the agricultural sciences, the good conception and excellent treatment of the material by the experienced author succeeded in writing a textbook of great interest also for biochemists, medical experts and technicians. The exterior of the book is worthy of its contents.

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