blowing in the opposite direction are normally at an elevation of somewhat over 10,000 ft. Aphids have been collected at an elevation of 13,000 ft, however (*1*), and they may possibly occur at even higher elevations. Occasionally, also, winds from the northwest strike Puerto Rico, possibly originating in Florida and Georgia, or even farther west and north in the continental tobacco-growing regions of the U. S. More probably, antitrade winds of local origin may have carried aphids from tobacco-raising areas of Cuba and Hispaniola, for this aphid was definitely reported from the San Juan y Martínez region of Pinar del Río Province, Cuba, for the first time in 1948 (*2*), and is now present in the Dominican Republic.

The strongest evidence in favor of migration is parallelism with the spread of the spirea aphid, *Aphis spiraecola* Patch, first noted on citrus in Florida in 1922, becoming a serious pest by 1923 (*3*), occurring in Cuba by 1924 (*4*), and intercepted by S. D. Whitlock on grapefruit at Mayagüez, P. R., on Oct. 23, 1926. This aphid had never before been collected in Puerto Rico and could hardly have been overlooked, for the rosetting it causes on citrus is very conspicuous. By 1945 it was found in numerous localities on the island by José Adsuar on papaya, and subsequently he was able to prove the transmission of papaya mosaic by the green citrus aphid, *Aphis spiraecola* Patch (*5*), a disease unknown in Puerto Rico before this aphid appeared.

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Book Reviews

Thermodynamics of Alloys. John Lumsden. London: Institute of Metals, 1952. 384 pp. $5.50.

The subject of thermodynamics can be applied to a large number of physical phenomena. In *Thermodynamics of Alloys,* Lumsden has focused attention on the application of thermodynamics to the quantitative study of phase equilibria in metals and alloys. Although the generalized concepts and structure of thermodynamics may be found in numerous references, there has been a need for a reference source devoted to the application of thermodynamic potentials to alloy systems. Those engaged in metal science will probably find a place in their libraries for this volume.

The primary objective of the book is to show the reduction of physicochemical measurements to comprehensive free energy equations and how, from this, the equilibrium properties of the system can be calculated. The reader is assumed to be familiar with differential and integral calculus—otherwise, the text is self-sufficient with respect to the thermodynamics necessary for the problems considered. In terms of classical and quantum theory, introductory chapters develop the concepts and mathematical framework necessary for the quantitative application of thermodynamic potentials. The application to such topics as thermal capacity, thermal expansion, compressibility, Poisson's ratio and fusion of pure metals (to name but a few) precede the treatment of alloy systems. The development of free energy equations for alloy systems follows sections in which the experimental estimation of thermodynamic quantities is described. In the closing chapters, the forms of the free energy functions are related through statistical mechanics to atomic interactions. Tabulated functions are included to assist in the calculation of free energy changes.

An admirable organization of the text has been adhered to throughout the book. The thermodynamic concepts required for the application are set forth, after which experimental data for actual cases illustrate the salient points. Several chapters are devoted to the derivation of free energy functions from different types of measurement, and the application of these functions to the equilibria of actual systems including Zn–Sn, Zn–Cd, Zn–Cu. Several other systems are described more briefly. The use of data from experiments of different kinds to estimate the reliability of the thermodynamic calculations is shown in almost all cases.

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Scientific Book Register

Trees and Shrubs in Eastern North America. Keys to the wild and cultivated woody plants growing in the temperate regions exclusive of conifers. Benjamin Blackburn. New York: Oxford Univ. Press, 1952. 358 pp.

Soils and Soil Fertility. Louis M. Thompson. New York–London: McGraw-Hill, 1952. 339 pp. $5.00.

Initiation and Growth of Explosion in Liquids and Solids. F. P. Bowden and A. D. Yoffe. New York: Cambridge Univ. Press, 1952. 104 pp. $4.50.

Advanced Calculus. Wilfred Kaplan. Cambridge, Mass.: Addison-Wesley, 1952. 679 pp. $8.50.

Pulp and Paper: Properties of Paper and Converting, Vol. II. James P. Casey. New York: Interscience, 1952. 609 pp.

The Horse-Flies of the Ethiopian Region: Haematopota and Hippocentrum, Vol. I. H. Oldroyd. London: British Museum (Natural History), 1952. 225 pp. and plates. £2.