and we shall then discuss in detail the important implications which follow from this result.

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RECEIVED AUGUST 15, 1942

THE TEMPERATURE COEFFICIENT OF THE CONDUCTANCE OF POTASSIUM CHLORIDE SOLUTIONS

Sir:

In THIS JOURNAL, **64,** 1544 (1942), Li and Fang give conductance data for aqueous solutions of potassium chloride at temperatures from 15 to 40°; they were apparently unaware, understandably enough, of our results both for potassium and sodium chloride solutions at temperatures from 15 to 45° (Gunning and Gordon, *J. Chem. Phys.* **10,** 126 (1942)). Their conductances at 25° are in moderate agreement with those of Shedlovsky, Brown and MacInnes [*Trans. Electrochem. Soc.*, **66,** 165 (1934)] and our own, and their 15° numbers are also in rough agreement with the measurements of Thompson and his associates [THIS JOURNAL, **59,** 2372 (1937); **61,** 1219 (1939)] and ourselves. For 15°, however, they employ a linear extrapolation of the Shedlovsky function Λ_0'; Shedlovsky, Brown and MacInnes showed that a $c \log c$ term was required for potassium chloride at 25°, and we showed that it was even more important for 15°. It is for this reason that the value Li and Fang give for Λ_0 at this temperature (120.88) is considerably less than the one we obtained by an extrapolation from much lower concentrations, *viz.*, 121.09.

The values of Λ_0 at 30° and 40° reported by Li and Fang are, however, about 0.25 and 1.1% less than those obtainable by interpolation in Gunning and Gordon's Table V. From LeRoy, Allgood and Gordon's transference data [*J. Chem. Phys.*, **8,** 418 (1940)] t_-^0 is 0.5103 at 30° and 0.5120 at 40°; combining these with Li and Fang's values of Λ_0, one obtains 84.00 and 99.42 as the limiting mobility of chloride ion at these temperatures; Gunning and Gordon's Table VI, which resulted from a consideration of the transference and conductance measurements for *both* salts, gives 84.22 and 100.52. Interpolation of Owen and Sweeton's results for hydrochloric acid solutions [THIS JOURNAL, **63,** 2811 (1941)] gives 84.3 and 100.9; these are in agreement with Gunning and Gordon's values within the uncertainty of the transference numbers Owen and Sweeton were forced to employ.

If the discrepancy be ascribed to error in the temperature, this would correspond to a difference of 0.1° at 30° and to 0.6° at 40°; Li and Fang give no information about their temperature scale beyond stating that they used standard thermometers; our temperatures were determined by platinum resistance thermometer with N. B. S. certificate. It would therefore seem that Li and Fang's 30° and 40° data should be considered, for the moment at any rate, with reserve.

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RECEIVED JULY 29, 1942

NEW BOOKS

Introduction to the Theory of Relativity. By PETER GABRIEL BERGMANN, Member, Institute for Advanced Study, 1936–1941; Assistant Professor of Physics, Black Mountain College. With a Foreword by Albert Einstein. Prentice-Hall, Inc., 70 Fifth Avenue, New York, N. Y., 1942. xvi + 287 pp. Illustrated. 15.5 × 23.5 cm. Price, $4.50.

This book not only appears with the *imprimatur* of Albert Einstein, but contains, p. 253, some hitherto unpublished work by Einstein and Bergmann. The proofreading has been astonishingly thorough: "mass" for "velocity" on p. 92, and superscript "s" for "5" in equation (18.24) on the very last page of the text, are the only errors the reviewer has found; he has, however, some differences of opinion with the author. The distinction between Riemannian and Lobachevskian spaces should be preserved, even if it is not of particular interest to the present discussion. The author recognizes, p. 60, that "only when *n* is 3 is the 'conjugate' tensor density to a tensor of rank 2 a vector density," but still adheres to Hamilton's definition of the vector product. (To one reader, at least, tensor densities seem "excess baggage.") The treatment of relativistic electrodynamics in Chapter VII is distinctly less elegant than that of E. B. Wilson and G. N. Lewis (1912), principally because the author has given the Cartesian interpretation of the derivation, step by step; to the reader who is not prepared to *think* in tensor terms this will not seem a defect.

The convention of calling tensors of negative rank "covariant" and those of positive rank "contravariant" is