ert C. Dexter, professor of social science. Dr. Barnes has accepted a position in the sociological department at Smith College. Mr. Dexter will become head of the department of sociology at Skidmore College.

Dr. Frederick G. Banting, Toronto, will be appointed to a chair in medicine at the University of Toronto if plans of the university and the provincial government materialize. An annual allowance of $10,000 accompanies the appointment, $6,000 being for salary and the remainder for supplies, assistants and other expenses.

DISCUSSION AND CORRESPONDENCE

CONCENTRATIONS OF IONS OF INSOLUBLE OR UNDISSOCIATED SALTS IN SOLUTION

Professor Rodebush in his recent comment[1] on a note by the writer on the mode of reaction of slightly soluble salts[2] has pointed out the improbability of the existence of a statistical equilibrium in a solution with only one ion or even less per liter. Since, as a result of the work of Gibbs and Boltzmann, entropy and thermodynamic equilibrium are considered to be statistical phenomena, it follows that when a statistical equilibrium is improbable, a thermodynamic equilibrium is likewise so. As a matter of fact, the concentrations of cathions of insoluble sulphides or complex ions obtained by calculation from E. M. F. measurements are of such a magnitude as to exclude thermodynamic equilibrium which is the fundamental assumption underlying such a calculation.

It is very questionable whether Knox's[3] calculations of the solubilities of the sulphides based on E. M. F. measurements should be taken literally. That these calculations are not always valid may be seen from the fact that while Knox gives a value of 2.6×10^{-15} for the solubility product of PbS, Noyes and Bray[4] find by precipitation methods a value of at least 1.8×10^{-22} and Stieglitz[5] believes that 2×10^{-27} is not low enough.

One of two possibilities suggests itself: either there is a sufficient concentration of ions in the solutions of the insoluble substances to make possible a thermodynamic equilibrium and that the resulting E. M. F. is not indicative of the actual ionic concentration, but rather of the effectiveness of the concentration present as compared to that of a solution containing one mole of ions per liter; or there is no thermodynamic equilibrium and the E. M. F. is not the result of an equilibrium between the electrode and the particular ions in solution. From the agreement in the degree of insolubility of the series of sulphides as found by E. M. F. measurements and by precipitation methods, it would seem that we may assume the first alternative to be the correct one and as another instance of the unreliability of calculations from such measurements at low concentrations.

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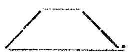
1 Science, N. S., lvii, 358, 1923.
2 *Ibid*, lvii, 26, 1923.
3 *Trans. Faraday Soc.*, iv, 44, 1900.
4 *J. Amer. Chem. Soc.*, xxix, 137, 1907.
5 Qual. Chem. Analysis, Vol. I, p. 212, 1916 edition.

AN EGYPTIAN MATHEMATICAL PAPYRUS IN MOSCOW

In an article[1] which appeared in 1917, Mr. B. Touræff gives an account of a mathematical papyrus of the late middle empire, now in the Museum of Fine Arts in Moscow.

The translation of probably the most important new problem, giving the volume of a truncated pyramid, is as follows:

"The problem is to make a . If it be said: ' . . . 4 below, 2 above,' do as follows: square this 4, which gives 16; duplicate 4, which gives 8. Do as follows: square the 2, which gives 4. Add the 16 to the 8 and the 4, which gives 28. Do as follows: take one third of 6, which gives 2. Do as follows: take 28 twice, which gives 56. This is the 56. You will find it correct."

This is precisely following the formula which we would use to calculate the volume of a truncated square pyramid with upper base 4 on a side, with lower base 2 on a side, and with altitude 6.

The remarkable appearance of this formula

1 "The volume of the truncated pyramid in Egyptian mathematics," Ancient Egypt, 1917, pp. 100-102.