MR. CHARLES W. PUGSLEY, of Lincoln, Nebraska, assistant secretary of agriculture, has presented his resignation to Secretary Wallace and has accepted the presidency of the South Dakota College of Agriculture and Mechanical Arts.

DR. J. HOWARD BROWN, Europa, Miss., and Dr. William L. Holman, San Francisco, have been appointed associate professors in bacteriology at Johns Hopkins Medical School, to succeed Dr. Stanhope Bayne-Jones, who resigned to become head of the department of bacteriology in the University of Rochester Medical School.

DISCUSSION AND CORRESPONDENCE

ON THE DONNAN EQUILIBRIUM AND THE EQUATION OF GIBBS

THE theory of membrane equilibrium due to F. Donnan (1911) is exciting much attention at the present time. There is no doubt that it is one of the most important contributions to colloid chemistry, and as the work of a fellow countryman, I do not wish to diminish the praise that has been given to it. Nevertheless, it is of historical interest to find that the Donnan equilibrium is one more addition to the list of theories implicit in the work of J. Willard Gibbs, published in the transactions of the Connecticut Academy in 1875. It is remarkable that Gibbs' equation has been overlooked for more than forty years, in view of the fact that membrane equilibrium enters into so many problems.

The following quotation is taken from the 1906 edition of "The Scientific Papers of J. Willard Gibbs," Vol. 1, p. 83:

We will, however, observe that if the components S_1, S_2, etc., can pass the diaphragm simultaneously in the proportions a_1, a_2, we shall have for one particular condition of equilibrium

$$a_1 m_1' + a_2 m_2' + \text{etc.}, = a_1 m_1'' + a_2 m_2'' + \text{etc.} \ldots \text{"} \quad (78)$$

a_1 = equivalent weight of substance S_1
a_2 = equivalent weight of substance S_2
$m_1' = m_2'$ are the potentials of S_1, S_2 inside the membrane
$m_1'' = m_2''$ are the potentials of S_1, S_2 outside the membrane

If S_1, S_2 behave like perfect gases, equation (78) can be simplified since $dm_1 =$ at. d. log p_1 (285) where t is the temperature and p the pressure

$$\log p_1' + \log p_2'' = \log p_1'' + \log p_2''$$

expressing concentrations in the conventional manner this becomes

$$[S_1]' \times [S_2]'' = [S_1]'' \times [S_2]''$$

Equation (78) applies to solutions of electrolytes which do not obey the gas laws, but we have stated this simple form of it for comparison with Donnan's equation:

$$[Na]' \times [Cl]' = [Na]'' \times [Cl]''$$

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IRON-DEPOSITING BACTERIA

THE presence of three kinds of iron-depositing bacteria (*Spirophyllum ferrugineum* Ellis, *Gallionella ferruginea* Ehrenburg, *Leptothrix ochracea* Kützing or *Chlamydothrix ochracea* Migula) in the natural chalybeate waters around Yellow Springs, Ohio, seems not to have been reported previously.

Gallionella, according to Harder,[1] has been reported in three localities in the United States, *viz.*, from mines in southwestern Wisconsin, central Minnesota and from the city water supply of Madison, Wisconsin. As found at Yellow Springs, Gallionella, as well as the other two genera mentioned above, is abundant in the water that issues to the surface in the Cedarville limestone. One of these chalybeate springs has made a large deposit of ocherous material, which gives us some indication that the deposition at this particular spring has probably been going on for a long time.

As noted by Harder[1] it is quite striking that these iron bacteria are so peculiarly distributed, their distribution sometimes seeming to depend upon the amount of iron in the water, but often on other less well-known causes. We have many springs in this vicinity and these bacteria appear in a very few of them. The causes of distribution as well as many morphological and physiological features of these iron-depositing bacteria remain unsettled.

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WATER GLASS AS A MOUNTING MEDIUM

THE use of the common water glass or egg preserver as a mounting medium for microscopic objects has not been reported to my knowledge. Very recently I have had occasion to use it with such apparently successful results that I am forwarding this note in the hope that others who possibly have tried it successfully or otherwise will give us the benefit of their experiences.

It is used in the same manner that one would employ with Canada balsam, but has the added advantage that dehydration is not necessary. The medium at the periphery of the cover glass quickly hardens to the consistency of glass itself, thus sealing in the liquid center in which the specimen is held. The liquid condition of the medium surrounding the specimen, while viscous enough to prevent movement,

[1] Harder, E. C., "Iron-depositing bacteria and their geologic relations," U. S. Geological Survey Professional Paper 113.