strains studied. This is appreciably lower than that reported (p_H 6.6-6.8) for two strains by Fred,[3] but agrees very closely with the senior writer's findings regarding the maximum hydrogen-ion concentration tolerated by these organisms in soils (p_H 5.9-6.0).[4]

As the hydrogen-ion concentration of the medium decreased, growth increased until p_H 6.1 to 6.4 was reached. Here growth appeared to be quite as vigorous as at lower concentrations.

No fixation of nitrogen took place in a hydrogen-ion concentration greater than p_H 5.9, while fixation in concentrations of p_H 6.3 to 6.5 was as great as in lower concentrations. The optimum reaction for the fixation of nitrogen appeared to be very closely associated with the optimum reaction for growth.

The total quantity of acid produced by the various cultures was insignificant. The culture medium employed required only about 0.05 cc N/1 acid per 100 cc to produce a change of 0.1 p_H in reaction. Even with this low buffer index only slight changes in the hydrogen-ion concentration of the medium were produced by the growth of any strain of the organism. This would indicate the production of inappreciable quantities of either acid or basic metabolic by-products by these organisms.

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KANSAS AGRICULTURAL
EXPERIMENT STATION

PRELIMINARY NOTES ON VAUXITE AND PARAVAUXITE

AMONG the mineral specimens collected on the Vaux-Academy Andean expedition of 1921 are two that have proved to be new. As the crystallographic work on these will take some time, the following brief notes are therefore presented:

VAUXITE

Color: Sky-blue to Venetian-blue (Ridgway); streak white. Luster vitreous. Transparent. Form: Aggregates of small crystals tabular parallel to b (010). Hardness 3.5. Specific gravity = 2.45.

Composition: 4 FeO. 2 Al_2O_3. 3 P_2O_5. 24 H_2O + 3 H_2O.

Crystal system: Triclinic.

Optical properties: Optically +; $\alpha = 1.551$; $\beta = 1.555$; $\gamma = 1.562$; all $\pm .003$; $\gamma - \alpha = .001$; $2V = 32°$; Bx_{ac} emerges on sections parallel to b (010). Dispersion considerable $\rho > \upsilon$. Strongly pleochroic, colorless to blue.

Occurrence: On wavellite from the tin mines of Llallagua, Bolivia.

Name: In honor of the well-known amateur mineralogist, Mr. George Vaux, Jr., of Bryn Mawr, Pennsylvania.

PARAVAUXITE

Colorless; streak white. Luster vitreous to pearly. Transparent. Form: Small prismatic crystals. Hardness 3. Specific gravity: 2:30.

Composition: FeO. Al_2O_3. P_2O_5. $6H_2O$ + $5H_2O$.

Crystal form: Triclinic. Cleavage, perfect parallel to b (010).

Optical properties: Optically+; $\alpha = 1.554$; $\beta = 1.558$; $\gamma = 1.573$; all $\pm .003$; $\gamma - \alpha = .019$; 2V (calculated) 35°. Sections parallel to b (010) show the emergence of an optic axis.

Occurrence: On wavellite from Llallagua, Bolivia.

SAMUEL G. GORDON

ACADEMY OF NATURAL
SCIENCES OF PHILADELPHIA,
APRIL 15, 1922

THE AMERICAN CHEMICAL SOCIETY

(*Continued*)

SECTION OF CHEMICAL EDUCATION

Edgar F. Smith, *chairman*
Neil E. Gordon, *secretary*

First year college chemistry: WILLIAM MCPHERSON.

A first course in general chemistry: WILHELM SEGERBLOM. A brief comparison is made of fourteen of the more modern texts in chemistry suitable for secondary schools. The results of a recent text-book survey made by the New England Association of Chemistry Teachers are given. The usual custom of starting beginners in chem-

[3] E. B. Fred: *Jour. Agr. Res.*, Vol. 14, pp. 317-336.

[4] P. L. Gainey: *Jour. Agr. Res.*, Vol. 14, pp. 265-271.