term. The first of the series died on the fourteenth day after parathyroidectomy probably from a hemothorax. Three hundred and seventy-five cc of almost pure blood were found in the thoracic cavity of this animal at autopsy.

Of the remaining two pregnant animals one went into labor four days after parathyroidectomy and gave birth to seven young. This animal showed slight tetany symptoms twenty-four hours after operation and again violent tetany at the time of labor. Three days later the consumption of an unusually large meal of meat precipitated a tetanic convulsion involving the diaphragm. Artificial respiration had to be given. The tetany was soon controlled by enemata and intravenous injections of Ringer's solution. The animal was kept throughout the puerperium on a moderate meat and bone diet. Artificial feeding of the young was resorted to in part. The latter contracted distemper, the last two dying from the disease on the twenty-sixth and twenty-eighth days after birth. The mother is alive at the time of writing (ninety-eighth day after parathyroidectomy). She has received no injections since the fifty-first day.

The other pregnant animal went into labor on the day of the parathyroidectomy and within twenty-four hours gave birth to nine young. Her tetany attacks were unusually severe and difficult to control. Several of her young died. Others were given away. *Unaided she raised four of her young to the stage of weaning.* The last intravenous injection was given on the fifty-second day after parathyroidectomy. She is alive at the time of writing and in splendid physical condition (eighty-seven days after operation).

Our chief conclusions are as follows:

1. By means of the intravenous injection of Ringer's solution completely parathyroidectomized animals can not only be kept alive for a prolonged period of time but if this treatment is maintained for *about* forty days they are to all purposes cured of their tetany.

2. On the basis of further work we find that normal Ringer's solution is better than Ca free Ringer's solution in controlling parathyroid tetany.

3. The source of the poison responsible for the tetany is of exogenous origin (particularly meat of the diet). One can precipitate an almost fatal attack of tetany thirty-three days after parathyroidectomy in two hours by feeding an animal one half pound of meat, especially if the latter is not fresh.

4. In addition to the intravenous injections of Ringer's solution it is important to avoid constipation by feeding bones and giving soap suds enemata.

5. Even pregnant dogs can be kept alive. Instead of dying in tetany within seventy-two hours after parathyroidectomy they can pass through pregnancy, labor, and raise their young. The control and cure of pregnant and lactating bitches is, however, much more difficult than in normal, non-pregnant animals.

6. None of the adult animals which have survived as long as seven months have shown any signs indicative of myxedema although both lobes of the thyroid gland were removed at the time of the parathyroidectomy. They are in excellent physical condition. The administration by mouth of dessicated thyroid gland in three gram doses every other day for more than one month did not have the slightest effect on their general condition and behavior.

7. The young animals born of and raised by parathyroidectomized mothers never showed any symptoms even suggestive of tetany.

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INFLUENCE OF H-ION ON GROWTH OF AZOTOBACTER[1]

WHILE studying the influence of the reaction of the soil solution upon the Azotobacter flora of soils,[2] it seemed desirable to ascertain the influence of the reaction of culture media upon pure cultures of these organisms. Several strains of Azotobacter were isolated from different soils and grown in dextrose media of different hydrogen-ion concentrations. The maximum hydrogen-ion concentration permitting growth was found to be p_H 5.9-6.0 for all

[1] Contribution No. 49, Department of Bacteriology, Kansas Agricultural Experiment Station.

[2] P. L. Gainey: SCIENCE, N. S. Vol. 48, pp. 139-140.

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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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

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

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

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-