opment of the spiritual forces centering in and radiating from this chapel."

DR. ALEXANDER G. RUTHVEN, professor of zoology and director of the museum of the University of Michigan, has taken up the work of dean of the school of business administration of the University of Michigan.

DR. KARL SAX has been appointed associate professor of plant cytology at Harvard University. He has been since 1920 biologist in charge of plant breeding at the Maine Agricultural Experiment Station.

PROFESSOR GEORGE ZEBROWSKI, associate in biology at Villa Nova College, has resigned to assume direction of the science department at Villa Maria College.

DR. LEON K. JONES, associate in research (plant pathology) in the New York State Agricultural Station, has been appointed assistant professor of plant pathology and plant pathologist in the Agricultural College of the University of Washington.

DR. ALBERT B. NEWMAN, research engineer of the General Chemical Company, New York City, has been appointed head of the department of chemical engineering at the Cooper Union.

DR. ROBERT RANULPH MARETT has been elected rector of Exeter College, Oxford, in succession to Dr. L. R. Farnell. Dr. Marett is known for his contributions to anthropology and has been president of the anthropological section of the British Association.

DISCUSSION

THE ISOLATION OF A BACTERIOLYTIC PRINCIPLE FROM THE ROOT NODULES OF THE LEGUMINOSEAE

GERRETSEN, Gryns, Sack and Söhngen[1] reported the isolation of a bacteriophage from the root nodules of bean, clover, lupine and other legumes. According to this report the bacteriophage was effective against most strains of the bacteria isolated from the same plant species.

Attempts by the author to secure a bacteriophage active against the organisms of the root nodules of leguminous plants, using the technic of the above investigators, were unsuccessful. In this work the filtrates from the broth cultures, which had been inoculated with the crushed nodules, were tested against proven laboratory strains of the bacteria. In no case was there any evidence of lysis even after a large number of serial passages.

[1] Gerretsen, Gryns, Sack and Söhngen, *Cent. Bakt. Abt.* II, 60: p. 311, 1923.

Recently a successful attempt was made to secure a bacteriolytic agent active against this group of organisms. In this case the filtrate from a broth culture inoculated with several crushed red clover nodules, taken from the same plant, was added to broth cultures of a strain isolated from these nodules. This strain has been tested and found to produce root nodules on red clover plants.

After three serial transfers a lytic principle was demonstrated which was active only against this strain of the organism. Complete lysis of young broth cultures is secured in about 24 hours after the addition of the lytic agent. Growth of the homologous organism on agar is inhibited by the addition of this agent.

So far, attempts to produce lysis of other strains of the red clover nodule bacteria by means of this lytic agent have been unsuccessful, even after several serial passages.

The specificity of this lytic agent is quite interesting in view of the general lack of specificity reported by other workers.

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SOME EFFECTS ON PISUM SATIVUM OF A LACK OF CALCIUM IN THE NUTRIENT SOLUTION

IT has long been known that the addition of calcium to the soil frequently has a beneficial effect in the growing of crops. In addition to neutralizing the acid in the soil, several other functions have been ascribed to it. The aim of this study has been to determine the effect of calcium, not as to its rôle in the soil nor at the entrance to the plant, but in its effect on certain anatomical structures of the plant. In this investigation, Canada field peas (*Pisum sativum* L.) were grown in sand cultures in the greenhouse and the nutrient solutions were varied in the amount of calcium. Plants were grown for periods of five weeks and of ten weeks. To some plants starved of calcium for five weeks, there was added the complete nutrient solution and the growth was noted over a subsequent period of five weeks.

Observations were recorded as to the external aspects of stems and roots. Green weight and dry weight determinations were made on one half of the plants. After these plants were pulverized, they were tested for calcium according to McCrudden's method. Prepared sections of stems and roots were studied microscopially for diversity in appearance. These were compared with similar sections from plants grown in the soil under the usual garden conditions. Areas of tissues in cross-section were