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.

E. R. HITCHNER

UNIVERSITY OF WISCONSIN

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

measured with the aid of a projection microscope and a planimeter.

In plants deprived of calcium, the length of stem is less than that of plants grown in the presence of calcium; the lower leaves are chlorotic, and the upper leaves are curled and tough. Plants grown without calcium for five weeks and then with a complete nutrient solution for five subsequent weeks show a rapid recovery and assume a normal appearance, while those plants starved of calcium for this entire period die at the end of nine or ten weeks.

Both the green and dry weight of the plant decrease as the amount of calcium is decreased in the nutrient solution. Chemical analyses of roots and of stems indicate that the calcium stored in the seed is used for early growth, since the amount of calcium oxide, calculated as percentage of green weight, or as percentage of dry weight, is slightly larger in the plant starved of calcium than it is in the plant given the complete nutrient solution. As is to be expected, the total amount of calcium, calculated as calcium oxide, is slightly greater in the plants given the complete nutrient solution than it is in a similar number of plants starved of calcium.

Whether the plants are grown under the usual garden conditions, in a nutrient solution with the full quantity of calcium, or in a solution lacking calcium, the anatomical structure of the stem and of the root remains constant, or the variation is so slight as to be insignificant. The difference is in the amount of elongation rather than in the anatomical structures. Further data and a detailed explanation of these conclusions will appear at a later date.

DOROTHY DAY

MILLS COLLEGE, CALIFORNIA

THERMAL CONDUCTIVITY OF GLASSES TRANSMITTING ULTRA-VIOLET LIGHT

INCREASED knowledge of the beneficial therapeutic effects of ultra-violet light upon living organisms has in recent years led to the development of a number of glasses which transmit ultra-violet light more or less completely. It is evident that if any of them are to replace the window-glass now being used they must be very poor conductors of heat, for otherwise man might pay dearly for the benefits secured by the use of these glasses because of the greater amount of heat they would allow to escape from a room by conduction.

The thermal conductivity for a number of these glasses has been determined at the Iowa State College by Christiansen's method. It was found that for every glass tested the thermal conductivity was less than for window-glass. By the use of some of these substitutes man would get ultra-violet radiations into the room and he would also lose less energy by heat conductivity through them.

WILLIAM KUNERTH

WILLIAM E. BERKEY

IOWA STATE COLLEGE

CACOEPISTIC SCIENTIFIC TERMS

I HAVE been much interested in the views that have been published lately in SCIENCE regarding the correct pronunciation of the word *research*. The art of uttering *research* with propriety is of concern to us, because the word is so very frequently used in Mellon Institute. We have always given preference to pronouncing it "rē-serch'." I have also noted the correspondence respecting the number of the word *data*. It is regrettable that some scientific writers do not regard it as plural, thereby failing to observe grammatical principles. It should be borne in mind that the singular form *datum* is a useful word that has a fixed place in scientific and technical reporting.

In this communication I wish to point out errors that are commonly made in pronouncing certain widely used chemical and medical terms. The standard of the pronunciation of scientists and professional men is all too frequently the authority of their own specialty teachers and not always the present usage of literary society and lexicography. Professional phonology, in part at least, is thus sometimes the product of fancy rather than of precise scientific practice based upon the principles of grammar. Every profession should have a sound, fully accepted orthoëpy for its specific terms.

Most pharmacists and many pharmaceutical chemists and physicians mispronounce the word *citrate* (sit'rāt) as "sī'trāt," notwithstanding the fact that, in general, they inconsistently but correctly pronounce *citric* as "sit'rik." Likewise they pronounce *salicylate* "sal'is-il-āt," instead of sal'i-sil-āt, the preferred chemical and lexicographic pronunciation. Recently we have heard a number of different chemists mispronounce *chemotherapy* (kem-o-ther'ap-e) as "kē"-mo-ther'ap-e"; this cacoëpy appears to be especially popular among manufacturing pharmacists who are featuring the use of the word in their sales promotion activities.

The following are among the other ordinary chemical terms that are often pronounced incorrectly: *acetate* ("ā-se-tāt" for as'et-āt), *amino* ("a-mi-no" instead of the lexicographically preferred am'in-o), *cyanamid* ("si-a-nam-id" for si-an'am-id), *hemoglobin* ("hē-mo-glo'bin" for hem-o-glo'bin), *methane* ("mē-thān" instead of meth'ān), *piperidin* ("pip-er-i'din" for pi-per'id-in), *ptomain* ("tō'mān" instead of tō'ma-in), *purin* ("pūr-in" for pu'rin), *saligenin*