take refuge in England. Special arrangements will be made as far as possible to meet the needs of French and Belgian students who desire to continue their studies in London.

PROFESSOR FRANK H. CONSTANT, formerly of the University of Minnesota, becomes head of the department of civil engineering at Princeton University, succeeding Professor Charles McMillan, who has retired and been elected professor emeritus.

JOHN E. BUCHER, associate professor of chemistry at Brown University, has been promoted to be head of the chemistry department to fill the vacancy caused by the retirement of Professor John H. Appleton. Dr. Harold Bigelow, of Mount Alliston University, is added to the faculty as assistant professor of chemistry.

DR. CHARLES ALTON ELLIS, formerly of the University of Michigan, and recently engaged as a practising engineer, has been appointed assistant professor of civil engineering in the University of Illinois.

DR. E. HAYNES, of the Lick Observatory, has been made associate professor of astronomy at Beloit College and director of the Smith Observatory.

J. CROSBY CHAPMAN, B.A. (Cambridge), D.Sc. (London), Ph.D. (Columbia), has been elected assistant professor of experimental education of Western Reserve University.

AMONG the new faculty appointments at Oberlin College the more important are the following: Dr. H. N. Holmes as professor of chemistry and head of the department. Dr. Holmes received his A.B. from Westminster College in 1899 and the doctorate from Johns Hopkins in 1907. He comes to Oberlin from Earlham to succeed Professor Allen W. C. Menzies who goes to Princeton. Dr. H. A. Miller has been made professor of sociology and head of the department. Dr. Miller received his A.B. from Dartmouth in 1899 and his Ph.D. from Harvard in 1905. He comes from Olivet College. Dr. George R. Wells is promoted to be associate professor of psychology and Dr. E. M. Kitch enters the department of philosophy as associate professor after two years of study in the University of Chicago.

CHANGES in the scientific staff of the University of Idaho have been made as follows: Dr. Chester Snow, associate professor of mathematics; Dr. John J. Putnam, associate professor of bacteriology, in charge of the department; Associate Professor C. W. Hickman, department of animal husbandry; Mr. Newell S. Robb, in charge of the department of agronomy; Assistant Professor O. W. Holmes, department of dairying; Professor C. E. Coolidge, mechanical engineering; Professor A. M. Winslow, civil engineering, and Mr. L. W. Currier, metallurgy and geology department.

MR. STANLEY F. BROWN and Dr. Wm. M. Thornton, Jr., have been appointed tutors in the department of chemistry, College of the City of New York.

DR. J. E. ROWE, of Dartmouth College, has been appointed assistant professor of mathematics in the Pennsylvania State College.

PROFESSOR R. H. YAPP has been appointed professor of botany in the Queen's University, Belfast.

MR. L. J. GOLDSWORTHY has been appointed professor of chemistry at the Victoria College of Science, Nagpur.

DISCUSSION AND CORRESPONDENCE

AN EXPERIMENT ON KILLING TREE SCALE BY POISONING THE SAP OF THE TREE

I HAVE in my grounds a plant of Spanish broom about a dozen years old and with a trunk about four inches in diameter which has for several years been seriously infested by cottony cushion scale (*Icerya purchasi*). I have tried various sprays, have put scale-eating beetles on the tree and at one time cut all the branches off and sprayed the trunk several times in the attempt to get permanently rid of this scale, but up to last winter it seemed that all attempts were in vain. In February of this year, when the broom was very thickly covered with the scale I bored a ⅜ in. hole in the trunk to a depth of about three inches, filled the hole nearly full of crystals of potassic

cyanide and plugged it up. In two days the scale began to fall from the tree and in a few days all appeared dead. Others hatched and attacked the tree, but lasted only a short time, and the tree has since been free from scale and very vigorous.

At the same time I bored a similar hole in an old peach tree which seemed to have passed its usefulness and put a like charge of potassic cyanide in it. The tree has since seemed more vigorous than before, and raised a fair crop of peaches. After feeding some of them to chickens and a rabbit with no apparent ill result, I ate some of the peaches, and could find nothing wrong with them. I have since put a similar charge of the cyanide in an orange tree with no apparent bad effect.

It would seem from this experiment that it is possible in some kinds of trees, at least, to poison scale and sap-eating insects without injury to the tree. The method would seem to be especially adapted to killing various kinds of borers and insects which, like the pine beetles, burrow beneath the bark.

Fernando Sanford
Stanford University, Cal.,
September 3, 1914

Laboratory Cultures of Amœba

To the Editor of Science: While *Amœba* may appear in hay infusions within five days, even when in sufficient quantity, it is often not desirable for laboratory study on account of its extremely small size. Again standard text-books of general biology give tolerably certain methods for obtaining the organism, within, however, a much longer time—in some cases from 5 to 6 weeks. The writer hopes that certain notes on this part of the laboratory routine may be of help.

In preparing laboratory cultures of *Amœba* during the past three years, he has been led to collect material for his infusions from a number of different types of environment—stagnant and freshwater ponds, swamps, sewage polluted streams, etc., and to make *composite* cultures of the material obtained. Such cultures, if not infertile, in the writer's experience rapidly attain the peculiar balance necessary for the flourishing growth of the organism, and yield in a comparatively short time, in one case as early as six days, a type of *Amœba,* which, if not always large, presents considerable advantage over that inhabiting the hay infusion. Such cultures have been available for study as long as eight days. Very frequently, too, there are produced an abundance of Spirillæ, etc., which the *Amœbæ* obligingly ingest, while the whole microcosm seems to be one superior to that obtained in the infusion as ordinarily made. A number of control cultures made at the University of Pittsburgh and the Osborn Zoological Laboratory, Yale University, showed that *Amœba* eventually appeared in one or more of the components of the composite culture, but in every case later. Without any attempt at explanation, it seems to the writer, that there may be some parallelism between the condition of environment obtained in such a composite culture and that in the "varied environment medium" as described by Woodruff.[1] In conclusion, it is noted that the results of the experiments have always remained fairly uniform, although widely separated geographical localities have been involved.

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The Origin of Mutation

The word mutation appears to have suddenly arisen in 1650, according to Lock. It appeared again independently two hundred and nineteen years later. This recent advent (1869) has been termed the "Mutations of Waagen" (1912). Darwin at times spoke of species as "mutable," and de Vries (1901) has made the word famous.

Since in the pages of this journal and elsewhere in the States there has been an attempt to show that the word was preoccupied in a sense different from that in which de Vries used it, the following quotation from Lock, "Recent Progress in the Study of Variation, Heredity and Evolution,"[2] may be interesting.

[1] *American Naturalist,* XLII.

[2] Third edition, 1911, p. 124.