killed in France last year, and a donation of £51 from Miss Gertrude Jones for the purposes of the Galton Laboratory at University College.

President J. G. Schurman, of Cornell University, has received leave of absence from the university until next October and will devote the summer to patriotic work in France. During his absence, Professor Dexter S. Kimball, acting dean of Sibley College, is, by appointment of the board of trustees, acting president of the university.

At the University of Minnesota Professor H. H. Kildee has resigned as professor and chief of the dairy husbandry division in order to become head of the department of animal industry at the State College of Iowa at Ames; G. E. Weaver and H. R. Searles have resigned as assistant professor and intructor, respectively, of dairy husbandry to enter government service with the marines; Miss Josephine T. Berry has resigned as professor of nutrition and chief of the Division of Home Economics in order to continue her work as assistant director for home economics of the Federal Board for Vocational Education; Miss Mildred Weigley who has been associate professor and acting chief during Miss Berry's leave of absence has been promoted to the position made vacant by Miss Berry's resignation. I. D. Charlton has resigned as professor and chief of the Division of Farm Engineering in order to enter war service; J. S. Montgomery has resigned his position as associate professor of animal husbandry in charge of the section of horse husbandry in order to accept a position with a large stock breeder.

Mr. A. M. Chickering, instructor in biology in Beloit College for several years, has been elected to the professorship of biology in Albion College and will assume his new duties with the opening of college in September.

Miss Alice M. Boring has resigned as associate professor of zoology at the University of Maine and received an appointment in the premedical department of the Peking Union Medical College, China.

Dr. Seth Lake Strong, who was graduated from the Harvard Medical School in the class of 1913, has been appointed lecturer in surgery to the Royal Medical College at Bangkok, Siam, and will also act as surgeon to the Siravaj Hospital there.

Captain M. J. Stewart has been elected professor of pathology and bacteriology in the University of Leeds. He received his commission in 1915 and has served as pathologist to the East Leeds War Hospital, and in a similar capacity in France. A few months ago he was recalled to Leeds and undertook the acting headship of the department of pathology and bacteriology.

The following appointments are announced in the geological sciences in Germany and Austria: Professor W. Branca has retired from his professorship in Berlin, and has been succeeded by Professor J. Pompecki, of Tübingen. Professor E. Kayser has similarly retired in Marburg, and his successor is Professor R. Wedekind. Professor L. Milch, of Greifswald, has followed the late Professor Hintze as professor of mineralogy in Breslau, and Professor E. Hennig, of Berlin, has become professor of geology at Tübingen. Professor O. Abel has been made professor of paleobiology in Vienna.

DISCUSSION AND CORRESPONDENCE

FORMATIVE SETTING OF LACCOLITHIC MOUNTAINS

Although the simple "Blister" hypothesis of laccolithic intrusion, which was for the first time proposed for the Henry Mountains in southern Utah, finds so few supporters, of late little is done towards arriving at a better solution. Perusal of the descriptions of the Henry Mountains soon discloses the fact that not all of their story is yet told. There is nowhere any suggestion of relationships possibly existing between the local tectonics and the intrusive structures. Without these the phenomenon seems, as has been so often urged, a mechanical impossibility. This is the view which most Europeans take. In consequence they frequently confound laccolithic structure with that presented by denuded volcanic necks.

A number of facts militates strongly against the Henry Mountains explanation of loccolithic protuberance. Three basic premises appear wholly untenable. Most vitiating is the seeming incompetency of simple hydrostatic pressure to produce the desired results. Inadequacy of relative lithologic density is now commonly conceded. There also appears to be a radical disparity between the physical conditions accompanying the formation of laccoliths and their once supposed nearest kin the sills.

On the other hand the recent unearthing of the infrabasal make-up of certain laccoliths clearly points to a fundamental dependence of this class of mountains upon prior geologic structure. The shape of laccolithic masses is found to be cuneiform instead of lenticular; and thus at once does away with the blister idea. Quite essential appears to be the presence of crustal lines of weakness. The magmatic swelling or localization of laccoliths is discovered to be a direct function of orographic potentialities.

In seeking an immediate cause for his laccolithic intrusion Professor Gilbert did not lose sight of certain mechanical shortcomings of his explanation. These he sought to overcome by appealing to certain associated factors, which, however, later, Doctor Cross showed to be both unnecessary and not demonstrated as such. Professor J. D. Dana got over the difficulties by brushing aside all considerations except simple hydrostatic pressure and with this feature alone regarded the Gilbertian hypothesis complete. This is doubtless one of the main reasons why from a mechanical angle leading European geologists have so persistently challenged the American view of laccolithic intrusion. At the same time Old World writers on the theme offer no alternative theory to take the place of the one which they seek to discredit. Through the results of close inspection of certain laccoliths of northern New Mexico the chief objections which were raised against the Gilbert view seem to be fully met. Controlling tectonic factors which all describers of laccoliths have missed thus appear to supply the long sought desiderata.

As a primary consideration in order that a laccolith be produced rather than any other form of volcanic manifestation it appears that the intrusive mass shall have a particular tectonic setting. Profound faulting is one of these prime factors. Another is orographic flexing by which the rigidity of certain arching strata largely maintains the load of superincumbent materials. Probably the high viscosity of acidic magmas has an important but as yet uncalculated influence on events. The remarkable infrabasal structure which the New Mexico laccoliths reveal carries the inquiry a step more remote and explains the deep-seated cause of the major faulting, whereby an orographic prism is sustained by a sharp Pre-Cambrian arch, the rigidity of which is not even yet lost although the adjoining blocks on either side are allowed to slide down, as it were, the steep sides of the old flexure.

Now at the southern terminus of the Rocky Mountain Cordillera, in northern New Mexico, there is a succession of open flexures, the amplitude of which grows less as they recede from the main axis. It is where these folds cross great fault lines that laccoliths form. Thus through direct mathematical analysis of the tectonic problems presented and in the satisfaction of the most urgent tectonic demands an adequate *raison d'être* for laccolithic genesis and location seems to be offered.

CHARLES KEYES

SOIL REACTION AND THE PRESENCE OF AZOTOBACTER

DURING the summer of 1917 the writer conducted a preliminary survey of local soils to ascertain the relative nitrogen-fixing ability and prevalence of *Azotobacter*. Ninety soils were collected within two miles of the laboratory. The samples were taken from as widely varying soil conditions as could be located including the following: cultivated, permanent alfalfa, bluegrass sod, native pasture, barren hilltops, river bottom, sand bar, roadside and forest.