very clearly are not indigenous to the flood plain materials that form the ridge. The supposition is that they were forced up from below by gaseous and water pressure that gave rise to the craterlets.

Age: No evidences as to age was obtained by the writer. However, as similar craters are found farther to the north and are there shown to have been formed at the time of the New Madrid earthquake, it is logical to assume that these were formed during the same disturbances.

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AZOTOBACTER IN SOILS[1]

SOME time ago the writer[2] called attention to the apparent relation existing between the presence of Azotobacter in soils and the absolute reaction of the soil. At that time less than one hundred soils, all local, had been examined and the reaction was determined colorimetrically upon an extract of the soil. Since then 418 samples of soil collected from 39 counties in Kansas and 25 states other than Kansas have been cultured for Azotobacter and their presence or absence in such cultures compared with the absolute reaction of the soil determined colorimetrically upon an extract of the soil, and also with the reaction of the soil determined electrometrically upon a suspension of the soil.

These soils have been arbitrarily divided into two groups: those, the hydrogen-ion concentration of which was found to be greater than 1×10^{-6}; and those with a lower hydrogen-ion concentration. This particular division point has been chosen because the large amount of data that have been accumulated indicate that the maximum hydrogen-ion concentration tolerated by Azotobacter is very near this point. Comparing the presence and absence of Azotobacter in these two soil groups with the reaction we can, by making use of Yule's[3] association correlation formula, obtain a mathematical expression for the association or correlation existing between the reaction and the presence or absence of Azotobacter.

An application of this formula to our data gives, when the reaction of the soil was determined colorimetrically, a coefficient of 0.956. When the reaction was determined electrometrically the coefficient was found to be 0.942.

It has been demonstrated in this laboratory that when Azotobacter are introduced into a soil with a hydrogen-ion concentration greater than 1×10^{-6}, and not containing Azotobacter, they can exist therein for an appreciable length of time. Considering the relative ease with which soils may become inoculated under natural conditions, and also the probability that other conditions may inhibit the growth of Azotobacter in soils the reaction of which is favorable, it is believed that an association, or correlation coefficient as high as that indicated above is significant in indicating the influence of the hydrogen-ion concentration of a soil upon the ability of that soil to support Azotobacter.

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[1] Contribution No. 47, Department of Bacteriology, Kansas Agricultural Experiment Station.

[2] P. L. Gainey: SCIENCE, N. S., 48, pp. 139-140; *Jour. Ag. Res.*, 14, pp. 265-271.

[3] G. Udny Yule, *Phil. Trans. Roy. Soc.*, Ser. A, Vol. 194, pp. 257-319.

GENERAL MEETING OF THE AMERICAN CHEMICAL SOCIETY

THE sixty-third general meeting of the American Chemical Society was held at Birmingham, Alabama, Monday, April 3, to Friday, April 7, 1922, inclusive. The council meeting was held on the third, the general meeting on the morning and afternoon of the fourth and divisional meetings all day Wednesday and Thursday. Excursions were enjoyed in Birmingham on Friday, and some fifty of the members took a special excursion to Muscle Shoals on Saturday. Full details of the meeting and program will be found in the May, 1922, issue of the *Journal of Industrial and Engineering Chemistry*. The registration was 381, coming from 36 states and one from the island of Mauritius. Twenty-eight ladies attended the meeting.

General public addresses were given by Carlile P. Winslow, director, U. S. Forest Products Laboratory, on "The development of