the employ of the Sinclair Oil and Refining Corporation as geologist, has returned to the university this year, but retains his connection with the Sinclair companies.

Mr. L. A. Rumsey, former instructor in organic chemistry at Iowa State College, has been appointed head of the department of chemistry at Denison University, Granville, Ohio.

Dr. R. K. Strong, of the University of Chicago, has been appointed as professor of industrial chemistry at the Oregon Agricultural College.

DISCUSSION AND CORRESPONDENCE

RHYTHMIC PRECIPITATION

The abstract of Dr. H. N. Holmes's paper, read before the Kansas City meeting of the American Chemical Society, April 12, 1917, which appears in Science, November 2, 1917, calls for some discussion. He proposes a "new" theory to account for rhythmic precipitation bands. I have recently given a short account of some of the earlier work in the subject in a paper in the *American Journal of Science* for January, 1917, from which it is clear that the theory is comparatively old, having been suggested twenty years ago by Ostwald senior, and established six years later by Morse and Pierce.[1] Later workers have agreed with these pioneers, and recently I have shown that the rates of diffusion of the reagents have to be taken into account in explaining rhythmic precipitation, and that under certain conditions bands which become successively closer, or equally spaced bands, may be produced. Morse and Pierce also showed, fourteen years ago, that a gel is not essential to the formation of precipitates in separated bands, having obtained them in aqueous solutions. It is of interest and importance that Dr. Holmes has obtained them in loosely packed flowers of sulphur.

It might be asked what Dr. Holmes means by "crystalline banding of mercuric iodide." Is it possible that "banding of crystalline mercuric iodide" is meant? Again, it is difficult to understand what is meant by "a thickness of a few cubic centimeters," thickness usually being measured in one dimension, not in three dimensions.

I would take exception to the statement: "The color arrangement of agate is an excellent example of the phenomenon." It may possibly be an example of the phenomenon. I have not studied agates in sufficient detail to discuss the subject at this time, but such cursory examinations of agates as I have made have been sufficient to indicate that the offhand acceptation of agates as examples of rhythmic banding by precipitation within a medium of gelatinous silica is inadvisable. There are very few agates which are not susceptible of other explanation. Liesegang, in his "Geologische Diffusionen," after discussing agates as products of rhythmic precipitation within gelatinous silica, is careful to point out that he does not propose to apply this explanation universally.

It is unnecessary to state that the description of Dr. Holmes's experiments with silicic acid gels will be awaited with interest. From the partial account given in his abstract the experiments would appear to be along similar lines to those of Hatschek, and Hatschek and Simon.

J. Stansfield
Geological Department,
McGill University

[1] Morse, H. W., and Pierce, G. W., *Zeitschr. phys. chem.*, Vol. XLV., 1903, p. 589, or *Physical Review*, Vol. XVII., No. 3, September, 1903, p. 129.

GRAVITATIONAL REPULSION AND THE COMET

The results presented by the writer in a paper recently published by the Academy of Science of St. Louis[1] may be of assistance in explaining the behavior of the comæ and tails of comets. Twenty years ago Newcomb gave the following description in Johnson's Universal Cyclopædia.

> When a bright comet is carefully examined with a powerful telescope, a bow will sometimes be seen, partially bent around the nucleus on the side towards the sun. If watched from night to night, this bow will be found to expand from the nucleus, become diffused and finally lose itself in the nebulosity of the coma. . . . These bows seem to be

[1] *Trans.*, Vol. XXVIII., No. 5, November 8, 1917.