

formation is shown in Fig. 1, with magnification $1\frac{1}{2}$ times, and in Fig. 11 (mag. 25).

The colloidal solution chosen for these experiments was a Bredig copper hydrosol formed by making an arc under pure water with two copper wires in series with a resistance in a 110 volt circuit. As these copper particles bear a positive charge they would absorb from a solution of potassium chromate some of the chromate (negatively charged) ions.

Any theory explanatory of the Liesegang rings presupposes that the potassium chromate is originally equally distributed through the gelatine. The addition of copper colloidal solution to the gelatine containing traces of potassium chromate would alter the continuity of this distribution, if the copper particles strongly absorb the chromate ions. One would expect under these circumstances that the rings would not form.

Gelatine solutions were made up similar to those used to produce the rings shown in Figs. I and II, with the exception that a quantity of copper colloidal solution was used in place of water. If the gelatine solution was poured out as soon as the copper colloidal solution was added, concentric rings like those shown in Figs. I and II were produced in films made from both these preparations, but if the films were made several hours after the addition of the colloidal copper, the precipitate was in the form of microscopic quantities scattered over the plate around the central portion, some being gathered into piles, so that the whole area presented a blotchy appearance under the low power microscope. (Fig. III.)

It is evident from these results that the positively charged copper particles, as would be expected, do combine with the negatively charged chromate ions, for the nature of the precipitate is entirely changed when they are present. These results would also indicate that a certain interval of time is necessary for the diffusion of the copper particles through the gelatine solution and the formation of the copper-chromate aggregates.

The same idea was carried out with agar solutions. The agar was prepared by washing and boiling and straining, and the solutions were made up as were those containing gelatine. The phenomena observed are shown by micrographs. Fig. IV shows the outer boundary of the precipitates formed by the diffusion of a drop of a solution of ten gram molecular weight of silver nitrate per litre in a 1% agar solution containing one one-hundredth gram molecular weight potassium chromate per litre, and Fig. V shows the formation when copper colloidal particles are present in the same chromate-bearing agar solution. Some films containing only chromate showed