that had 23 somatic chromosomes. These aberrants are unavoidable sequence from the irregularities in the reduction division of F_1 hybrids. The aberrant plants were completely sterile. The extra chromosome in the trisomics was normal in size, but it was not a fragment as in Gotoh's (1924, 1932) forms.

Trisomic plants have probably originated after fusion of one gamete having 8 chromosomes with a normal gamete having 7 chromosomes. Gametes with 8 chromosomes can be formed when 6 bivalents and 2 univalents are formed during the first meiosis if both univalents go to one of the poles (6 + 2 = 8).

The plant with 23 somatic chromosomes has probably originated after fusion of one gamete having 16 chromosomes with a normal gamete having 7 chromosomes. Gametes with 16 chromosomes can originate from an 8 chromosomic nucleus formed after a chromosome distribution of 8–6 instead 7–7 during the first meiosis as just mentioned and then a doubling following non-occurrence of the second division.

Hybrids between cultivated rye and *S. montanum* has been occasionally produced by plant breeders (Duka). *S. montanum* is a perennial species and one can combine this character with the characters of the cultivated rye by hybridization. We wish to call the attention of the plant breeders that *S. ancestrale* might be used with success in plant breeding work when crossed with the cultivated rye. *S. ancestrale* is a productive and robust species and seems to be one of the most closely related species to the cultivated rye. *S. Vavilovii* behaves in the hybrids with cultivated rye in a similar way as *S. ancestrale*, but it is not so robust and so productive as *S. ancestrale*.

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Liesegang Rings and the Influence of Media on their Formation.

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THE role of gels in the production of banded precipitates has been the subject matter of many investigations. In the *Lucknow University Studies** Dr. A. C. Chatterji has given a summary of investigations carried out by him in collaboration with Dr. N. R. Dhar and others on "Liesegang rings and the influence of media on their formation". From the results of lead chloride, lead iodide and silver molybdate rings in agar, gelatine, silicic acid and starch gels, it has been inferred that with the same sparingly soluble precipitate, the character of the ring considerably changes when produced in different gels. In some, it is found very difficult to produce rings, while in others the formation of rings is very easy.[1] The gel is considered to have a specific influence and is by no means an indifferent medium which prevents mixing or merely fixes the precipitate at the position of formation.

Chatterji and Dhar attributed the specific nature of the gel to its protective effect in ring formation. According to their theory[2] of the Liesegang phenomenon, the rings are formed by the coagulation of a peptised sol. The coagulated mass in the course of its formation and when precipatated adsorbs and coagulates completely or partially the sol of the same substance from the neighbouring layers. Their theory differs from that of Ostwald[3] according to which the gel produces a supersaturated solution of the substance to be deposited in bands which are actually produced when the supersaturation is released and from that of Bradford[4] according to which one of the reacting substances is adsorbed by the layer of the precipitate, the result being a zone practically free from it, so that the clear spaces between the rings are at once accounted for.

In support of their theory of Leisegang rings Chatterji and Dhar[5,6] have recorded conductivity and E.M.F. measurements which show that Ag_2CrO_4, AgCl, AgCN, AgBr

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and AgI in gelatine gel are almost wholly in a state other than ionic. The results of Williams and Mackenzie,[7] Bolam and Mackenzie,[8] Desai and Nabar,[9] and Bolam and Donaldson,[10] indicate, however, that silver chromate is present in gelatine mainly in ionic condition. Naik, Desai and Desai[11] have subsequently found that silver chromate in gelatine is mostly in a condition other than ionic. These results of Desai and co-workers have been considered by Chatterji as corroborating his own work and hence supporting Dhar and Chatterji's theory of Liesegang rings.

It has to be pointed out that more recently Khanolkar, Barve and Desai[12] have shown that by suitable adjustment of the (i) temperature of the experiments, (ii) pH of the gelatine, (iii) concentration of the reactants and (iv) amount of gelatine, conditions can be so changed that the conductivity may (*a*) not decrease while the yellow colour persists, (*b*) decrease sometime after the colour change from yellow to red or (*c*) not change at all in spite of the colour change, the supersaturation being largest for case (*a*) and nil for case (*c*). It has been mentioned by Chatterji[13] that the percentage of silver chromate in condition other than ionic can be decreased by increasing the acidity of the medium due to enhanced solubility of the silver salt in acids. On the other hand Khanolkar, Barve and Desai[12] have shown from experimental results that while the percentage of silver chromate in non-ionic condition in the yellow mixtures (*i.e.*, before the appearance of the red colour) decreases with an increase in the acidity of gelatine solution, it is at a maximum in the red mixtures for pH value 5·75 (when conductivity does not change on standing). The conclusions of Chatterji and Dhar about the condition of silver chromate in gelatine are not therefore supported by the latest results of Desai and his co-workers.

It is doubtful if the theory advanced by Dhar and Chatterji about the formation of Liesegang rings in gels can be taken as satisfactory. According to Bradford[14] any substance can give a banded precipitate if it is obtained in a fine condition. The gels when used as media for the formation of rings, cause the substance to be deposited in a very fine condition, the fine particles being not always charged. According to the theory of Chatterji and Dhar one would expect that rings are not formed in cases where the substance to be deposited cannot previously be produced in colloidal condition.[15] Lloyd and Moravek[16] have, however, shown that periodic precipitation can be obtained even in gaseous, fluid and solid media besides gels; they have further shown that the effects of spatial relations, surface, concentrations of the reactants, temperature at which the reaction takes place, forward and backward diffusion, etc., have also to be taken into account besides the effects of media and of adsorption by the precipitate. From a critical examination of the various theories which have been put forward by different investigators it may be concluded that no single theory can explain all the known facts about banded precipitation.

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4. Bradford, *Biochem. Journ.*, 1916, **10**, 169; 1917, **11**, 14, 157.

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16. Lloyd and Moravek, *J. Phys. Chem.*, 1931, **34**, 1512.