NOTE ON GAMETIC REDUPLICATION IN *PISUM*.

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It was shown by Vilmorin and Bateson[1] that when a normal culinary pea having tendrils (T) and round seed (R) is crossed with the "Acacia" variety in which the tendrils are represented by leaflets (t) and the seed is wrinkled (r), partial coupling between T and R occurs in the gametes of F_1. The numbers suggested that the system of coupling was $63 : 1$. Further investigation of a number of plants of similar composition derived (in various generations) from this cross fully confirm the earlier results. From *round* seeds the numbers obtained were 1466 tendrilled, 20 acacia, on the expectation $63 : 1$ system being *1471 : 15*.

From *wrinkled* seeds the numbers were 15 tendrilled and 564 acacia, the similar expectation being *18 : 561*.

Only seeds of which the starch had been microscopically determined[2] were used for these results. This precaution is necessary because not very rarely occasional seeds of each class may on external appearances be referred to the wrong class. It should be mentioned that the round and wrinkled seeds, thus determined, though all the offspring of plants heterozygous for these characters, were selected independently of each other.

In these experiments the crosses were in the form $TR \times tr$, and the coupling was

$$63TR : 1Tr : 1tR : 63tr.$$

Subsequently crosses were made in the form $Tr \times tR$, a tendrilled

[1] *Proc. Roy. Soc.* 1911, 84 B, p. 9.

[2] By the method introduced by Gregory, R. P., *New Phyt.* II. 1903, p. 226.

variety having wrinkled seed being crossed with a round-seeded Acacia. The object of this cross was to see whether among the gametes of F_1 repulsion between T and R would occur[1]. The F_2 seeds were sorted into round and wrinkled by microscopical examination, and the result showed that repulsion occurred. The round seed produced 502 tendrilled, 270 acacia. The wrinkled seed produced 264 plants, all tendrilled.

The repulsion is presumably partial; but if, as is likely, the gametic distribution is $1TR : 63Tr : 63tR : 1\ tr$, only one plant in 16,384 would be wrinkled and acacia, so that any proof of this prediction is beyond the scope of practical experiment.

In view of the possibility that factors other than roundness might couple with the factor for tendrils, crosses have been made in which various factors have been introduced with the tendrilled and acacia characters. No signs of coupling or repulsion have been observed in F_2 from such crosses. Among the pairs of characters so tested were tallness and dwarfness, yellow and green cotyledons, purple and white flowers, glaucous and emerald foliage, fasciated and normal growth.

[1] Bateson and Punnett, *Journal of Genetics*, i. 1911, p. 293.