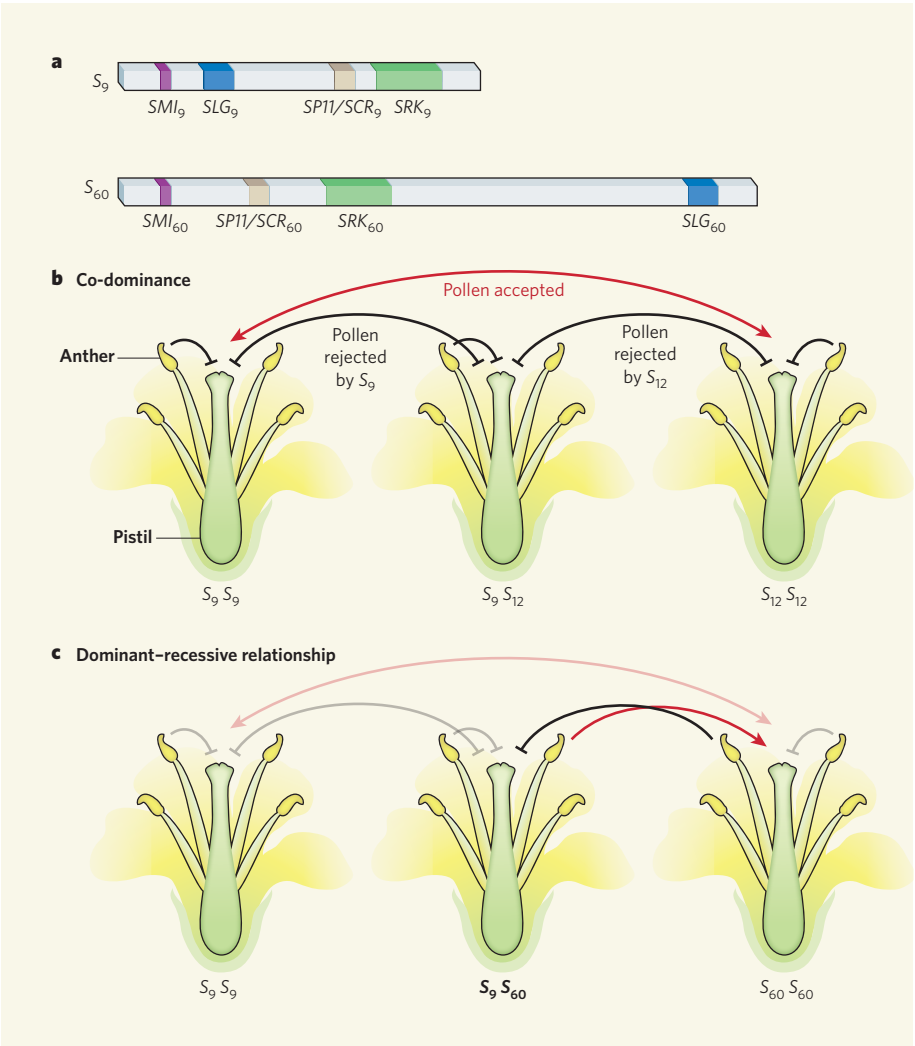

Figure 1 | The intricacies of the *S*-haplotypes. **a**, Tarutani *et al.*[3] report that, in addition to the three well-known genes, *SP11/SCR*, *SRK* and *SLG*, a fourth gene, *SMI*, also controls self-incompatibility in *Brassica* plants. In this example, two different *S*-haplotypes are shown, with S_9 being pollen-dominant and S_{60} pollen-recessive. **b**, When two *S*-haplotypes of the pollen are equally dominant, pollen rejection by the pistil occurs when the pollen-producing anther shares the same *S*-haplotype — in this instance S_9 or S_{12} — with the pistil. **c**, In cases in which there is a pollen-dominant (S_9) and a pollen-recessive (S_{60}) *S*-haplotype, the same rules apply as in **b**, except when pollen from the S_9 S_{60} anther lands on the S_{60} S_{60} pistil. Because the pollen-dominant S_9-haplotype suppresses the pollen-recessive S_{60}-haplotype in the anther (through the action of the SMI_9 small non-coding RNA), the S_{60} S_{60} pistil accepts the S_9 S_{60} pollen.

region containing dominant *S*-haplotypes and that carrying the recessive *S*-haplotypes (Fig. 1a). It encodes a small non-coding RNA (sRNA) that is specifically produced in the anther. Take Figure 1c, for example: Tarutani *et al.*[3] showed that production of an SMI_9 sRNA from the pollen-dominant S_9-haplotype results in methylation of the promoter of — and so silencing of — the pollen-recessive $SP11/SCR_{60}$ gene. Accordingly, the $SP11/SCR_{60}$ pollen protein is not produced to activate SRK_{60} in the pistil, and so the pollen grains from the S_9 S_{60} plant are accepted by the S_{60} pistil.

But why does this occur in only one direction — from the dominant to the recessive *S*-haplotype — when both *S*-haplotypes contain the *SMI* gene? Tarutani and co-workers discovered that the pollen-recessive *SMI* sequences carry an evolutionarily conserved change. When the authors introduced this change into the dominant S_9 *SMI* gene, the resulting sRNA could no longer silence the pollen-recessive *SP11/SCR* gene.

Another question is why the *SMI* gene of the pollen-dominant *S*-haplotype does not also silence its neighbouring $SP11/SCR_9$ gene within the same haplotype. For gene silencing, the *SMI* sRNA sequence must be closely related to its target sequence. The *SMI* sRNA of the pollen-dominant *S*-haplotype is highly complementary to only pollen-recessive, and not pollen-dominant, *SP11/SCR* promoters[3].

The gene-silencing activity of the pollen-dominant *SMI* genes is therefore due to the essential sequence identity to the pollen-recessive *SP11/SCR* promoters. Although at first glance this additional level of complexity — layered on top of the self-incompatibility

50 YEARS AGO

Thousands of people know the "Broads"... But how many holiday makers have ever asked themselves how these large lakes were formed?... Much research has been devoted to this problem in recent years, and it has been attacked from various points of view—geological, historical, philological, botanical, etc. As the outcome of these investigations it would seem that everything now points to the conclusion that the broads resulted from peat digging in the Middle Ages. Somewhere about the fourteenth century slight land sinkage, perhaps combined with a tidal break-through such as occurred a few years ago, flooded the peat workings, and this flood water could not drain away owing to the new lower level of the land relative to the sea... So whether the holiday maker is sailing over aristocratic Ranworth or stately Barton or proletarian Wroxham, let him spare a moment to remember the old peat workers, his forerunners, to whose labours his present enjoyment is due.

From *Nature* 20 August 1960.

100 YEARS AGO

In the year ending 1910, May 10, the average daily number of chronometers and watches being rated (at Greenwich) was 596 ... The average number of chronometers rated daily has, we learn, more than trebled since 1880, so that the burden of this work borne by the Observatory has enormously increased. The work is doubtless most valuable for the Navy, but is our great national Observatory exactly the place where it should be done?... In the present day, with the increase of speed, a ship is seldom isolated for any great length of time, and the breakdown of a single chronometer is unlikely to be a serious matter. Thus the case for a long trial does not seem so strong as it may have been a generation ago. Very probably ere long the development of wireless telegraphy may alter the whole situation.

From *Nature* 18 August 1910.

50 & 100 YEARS AGO