winter reservoirs of these viruses. Therefore the disease would be greatly reduced if the seed crop could be eliminated.

Beet seed is readily stored and keeps its germinating capacity for a long time; under ordinary warehouse conditions this capacity is only reduced by 50 per cent after storage for 5–9 years[13]. Moreover, beet and mangold seed crops occupy less than 3,000 acres of Britain. If seed crops of sugar beet and mangold were grown, throughout Britain, only in alternate years, the virus cycle would be broken and the disease controlled. Under the Destructive Insects and Pests Acts 1877 to 1927, the Minister of Agriculture possesses general powers to make Orders to prevent the introduction or spread of any disease or pest destructive to agricultural crops in England and Wales, and such Orders may include provisions to control and prohibit the growing of specified crops.

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Sugar Beet Mild Yellowing Virus : a Persistent Aphid-transmitted Virus

I have shown[1–3] that there are two aphid-transmitted viruses which commonly cause yellowing of sugar beet leaves in eastern England. One of these is beet yellows virus (SBYV), first described by Roland[4], and the other has been called sugar beet mild yellowing virus (SBMYV) by me[1]. The two viruses are apparently unrelated.

The virus–vector relationships of SBYV and *Myzus persicae* (Sulz) have been examined in detail by Watson[5,6] and later by Sylvester[7]. *M. persicae* acquired SBYV by feeding on infected sugar beet plants for 5–10 min., but the probability of successful transmission was increased by longer feeding times up to 12 hr.; the virus persisted in the aphid for less than 72 hr. in aphids feeding on virus-free plants and Sylvester consequently classified SBYV as a semi-persistent virus. Viruliferous aphids only needed to feed on healthy plants for a short time to cause infection, although the proportion of successful transmissions increased with longer test feeding times up to 6 hr. Watson[8] has reported that viruliferous aphids are no longer able to transmit SBYV after moulting.

The virus–vector relationships of SBMYV have now been studied at the Plant Breeding Institute, Cambridge, and the purpose of this communication is to report that this virus, unlike SBYV, is a true persistent virus. Very few successful transmissions were obtained when *M. persicae* was allowed to feed for 24 hr. or less on infected plants; the aphids appeared to reach maximum transmission efficiency after three or more days infection feeding. Test feeds of 24 hr. or more were necessary for efficient transmission, the best results being obtained by test feeds of 48 hr. or more. The results of one experiment in which the virus–vector relationships were studied are shown in Table 1. Other experiments have given similar results.

Table 1. Number of Successful Transmissions of SBMYV to Sugar Beet (20 Plants per Treatment) using Five *Myzus persicae* per Plant

Time on healthy plants (hr.)	Time on infected plants (hr.) 2	8	24	48	72	96	120	Total
2	0	0	0	4	9	10	11	34
8	0	0	3	7	10	11	8	39
24	0	0	6	10	16	15	19	66
48	0	0	6	14	20	19	20	79
72	0	0	5	17	20	20	20	82
Total	0	0	20	52	75	75	78	

SBMYV persisted for long periods in *M. persicae*; a large proportion of aphids which had fed for 4 days on infected sugar beet were still able to transmit the virus after 9 days on *Brassica pekinensis*, which is immune to SBMYV. It has also been shown that, unlike SBYV, aphids which have acquired SBMYV could still transmit the virus after moulting without access to further sources of virus.

In experiments to find better test plants than sugar beet for SBMYV in the glasshouse, *Claytonia perfoliata* Donn. and *Capsella bursa-pastoris* Medik were found to be very suitable for this purpose. Bjorling[9] showed that *C. perfoliata* is susceptible to SBYV, the leaves of infected plants showing numerous red spots; however, in plants infected with SBMYV the distal halves of the older leaves became a deep pink colour but without red spots within 2–3 weeks after inoculation. SBMYV was recoverable from *C. perfoliata* without difficulty. The symptoms of SBMYV infection in *C. bursa-pastoris* were a yellowing or purpling and thickening of the older leaves, often associated with marked stunting.

SBMYV is a persistent virus and SBYV a semi-persistent virus; this difference might influence the pattern of spread of the two viruses in the field, which could explain the observed differences in their distribution in East Anglia[1–3].

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A New Living Vaccine against Fowl Plague Disease

In a previous investigation[1] three attenuated substrains from a pea fowl strain were obtained by serial passages mainly in pigeon embryos. One of these substrains ($PFC_3\ P_{11}\ C_{30}$)—that is, pea fowl strain subjected to 2 passages in chick-embryos, 11 in pigeon-embryos and 30 in chick-embryos successively—was subjected for further attenuation to more than 400 passages in pigeon embryos using either the intra-allantoic or the intra-yolk route of inoculation. During these passages 33 desiccated batches were prepared from the pigeon embryos. These batches