results confirming the *in vitro* experiments are recorded.

Groups of six mice were treated with (*a*) small doses of sulphapyridine insufficient to give any protection either against streptococcus or staphylococcus, (*b*) small doses of penicillin, (*c*) both substances simultaneously in these doses.

Sulphapyridine was injected in 0·5 per cent suspension and given in doses of 0·1 c.c. twice daily intraperitoneally. A solution of sodium penicillin (about 90 units per c.c.) was injected in 0·2 c.c. doses, also twice daily. Treatment was continued for four days and the results were recorded at the end of seven days from the commencement of treatment. Each group of mice was infected, at the beginning of treatment, with 1×10^6 streptococci (strain 618) or with 500×10^6 staphylococci (strain 663). The table shown below gives the number of survivals.

	Streptococcus hæmolyticus							Staphylococcus aureus						
Days	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Sulphapyridine	6	2	1	1	1	1	1	0	0	0	0	0	0	0
Sodium penicillin	6	5	2	2	1	1	1	4	4	2	2	1	1	1
Sulphapyridine + sodium pen.	6	6	6	6	6	4	4	5	5	4	4	4	4	1
Control Strept.	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Treatment stopped ↑ (under Streptococcus column 5)   Treatment stopped ↑ (under Staphylococcus column 5)

The results show the increased protective effect of both substances given together. This might give an even greater survival rate if treatment were extended for more than four days.

The increased activity of both substances when applied simultaneously may be due either to the synergistic action of the two substances on the microorganism, or less probably to a chemical reaction between the sulphonamide and the penicillin. These possibilities are being investigated.

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It should be pointed out that penicillin is not yet available for general use.

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The Development of the Angoumois Grain Moth (*Sitotroga cerealella* Oliv.)

THE Angoumois grain moth has been known as an important pest of stored and field grain since the time of Réaumur[1], and it has possibilities as a laboratory insect. A search through the literature[1-9] revealed, however, that its life-history has apparently never been worked out in detail. A knowledge of the number and duration of the larval instars at 30° C. and 70 per cent relative humidity was required for a quantitative study of populations of this species, and some observations were consequently made under these experimental conditions.

One freshly laid egg was introduced into each of a hundred small vials. The latter were then examined daily until the eggs hatched, when one gram of fine wheat flour was added to each vial. The flour had been obtained from a local miller and sieved through

Instar	Duration in days		Width of head capsule (mm.)	Width of head capsule, calculated from Dyar's rule	Approx. width of thorax (mm.)	Approx. total length (mm.)
	Mean	Range				
Egg	3	2– 7				
First larval	6	4–10	0·15–0·19		0·22	1·2
Second larval	6	4–10	0·28–0·32	0·29	0·38	1·6
Third larval	5	2– 9	0·47–0·53	0·51	0·80	4·3
Fourth larval	7	6–12	0·76–0·84	0·85	1·65	7·0
Pupa	5	4– 7				
Total	32	30–40				

No. 52 (extra quadruple) silk bolting cloth. The larvæ of Sitotroga will develop quite successfully in this medium, although mortality is high. The contents of each vial were gently sieved daily, and moults deduced from the discovery of cast skins and checked by measuring the width of the head capsule. Four larval instars were found, followed by a pupa, from which the adult eventually emerged. Mature larvæ were found in hollows in the flour, lined by a delicate cocoon, against the glass side of the vial. They became quiescent for about two days before metamorphosis. The average duration and body measurements of each instar are shown in the accompanying table. The average ratio of increase in each instar, used in the calculations from Dyar's rule, was 1·7.

The body measurements are each the averages of observations of five individual larvæ, and the developmental periods the averages of observations of at least twenty-one individuals. Only twenty-two adults emerged from the hundred original eggs, twenty having been killed to make body measurements and fifty-eight dying. Twenty-one of these adults emerged within ten days of each other, while one did not emerge until the seventy-second day after oviposition. Such prolonged development has been observed by other authors[2,3], but under uncontrolled conditions of temperature and humidity. This abnormal individual was disregarded in calculating the average duration of the different instars. All its larval instars were longer than the average, while the pupal period was of average duration. The moths usually mated almost immediately upon emergence, and the pre-oviposition period was approximately one day. The average generation time was thus thirty-three days.

This is a suitable opportunity to correct an omission from a previous paper[4]. In line 11 from the bottom of p. 330, for "insects per grain" read "insects per grain, at which densities the average longevity was 6·6 and 4·4 days, respectively".

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