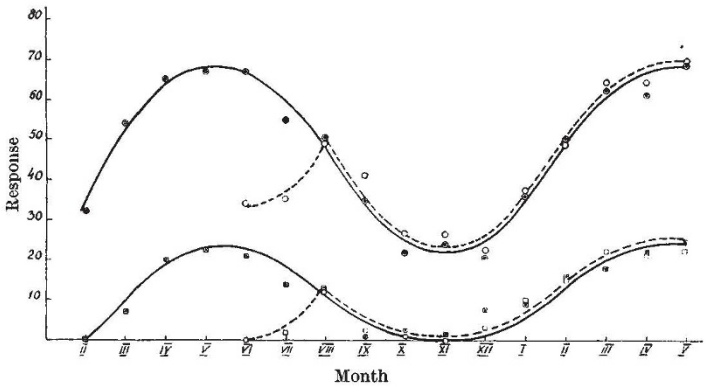
the percentage of mice developing full œstrus after each injection. A second group of mice was castrated in May 1937 and injections were commenced in June. It will be seen (broken line curves) that the responsiveness attains that of the former group (castrated in January 1937) in August, and that the curves thereafter closely follow the earlier ones.



Certain important conclusions may be drawn from our results. First, it may be said that the results of work on the œstrogen content of biological material, and based on vaginal smear methods not involving comparison with standard preparations, are highly inaccurate. Secondly, the existence of an extraneous factor modifying responsivity to œstrogens is indicated. Thirdly, should a similar rhythm exist in the human, the desirability arises of varying the dosage of œstrogens in replacement therapy, according to the season. Finally, in animals exhibiting seasonal sexual activity, variations in this activity may be due not necessarily to increased hormone production, but also to increase in responsivity.

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Decarboxylation of Aspartic and Glutamic Acids

ACCORDING to our earlier reports[1], the legume bacteria split off quantitatively one of the carboxyl groups from *l*-aspartic acid forming β-alanine,

$$HO_2C.CH_2.CH(NH_2).CO_2H \rightarrow HO_2C.CH_2.CH_2NH_2 + CO_2.$$

The reaction was at first accomplished only with living bacteria. We have now succeeded in observing it also *in the presence of toluene* with the same bacteria. The bacterial suspension, which had been kept 24 hours under toluene, split off carbon dioxide forming β-alanine in an aspartic acid solution (*p*H 7) in the presence of toluene.

In addition to aspartic acid, the legume bacteria split off the carboxyl group also from the *l*-glutamic acid forming γ-amino butyric acid,

$$HO_2C.CH_2.CH_2.CH(NH_2).CO_2H \rightarrow HO_2C.CH_2.CH_2.CH_2NH_2 + CO_2.$$

This compound has been isolated as the gold salt. The reaction is quantitative like that with aspartic acid. The *p*H optimum is likewise the same (*p*H 7). The rate of the decomposition of glutamic acid is somewhat higher than that of aspartic acid. Legume bacteria do not decarboxylate any other amino acids except aspartic and glutamic acids. Thus it may be assumed that the same enzyme is acting in the decarboxylation of both these amino acids. Since, however, Okunuki[2] has recently succeeded in decarboxylating glutamic acid with plant material, for example, dried beet powder, while aspartic acid does not react at all, it is likely that the legume bacteria contain two different amino acid decarboxylases, one decarboxylating glutamic acid (glutamic decarboxylase) and the other aspartic acid (aspartic decarboxylase).

As shown earlier by us[1,3], the coil bacteria split off the carboxyl group from lysine forming cadaverine almost quantitatively. We suggest the name lysine decarboxylase for this enzyme.

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[1] Virtanen and Laine, *Suomen Kemistilehti*, B, **10**, 2 (1937). *Enzymologia*, **3**, 266 (1937).
[2] Okunuki, *Bot. Mag.* (*Tokyo*), **51**, 270 (1937).
[3] Virtanen and Laine, *Suomen Kemistilehti*, B, **9**, 17 (1936).

Segmental Interchange Lines in *Pisum sativum*

IN a former communication[1], a list was given of seven lines of *Pisum sativum* with different arrangements of their chromosome segments. Four new types (structural types 8–11) have since been tested. The chromosome relationships now recognized are summarized in the following table.

			Chromosomes interchanged
Structural type	1	The normal or standard type (1, 2, 3, 4, 5, 6, 7)	—
,, ,,	2	Hammarlund's *K* line	1 and 2
,, ,,	3	The Thibet interchanged line	1 and 3
,, ,,	4	Extra Rapid	3 and 5
,, ,,	5	An interchanged type from Miss de Winton's material	4 and 5
,, ,,	6	An interchanged type from Prof. Winge	1 and 4
,, ,,	7	The doubly-interchanged type from Structural type 2 × Str. type 3	2 with 1 and 3
,, ,,	8	M_1, a new type originating at Merton	3 and 4
,, ,,	9	E.Gt.R., a new type originating at Merton in Early Giant Rogue stock	1 and 2
,, ,,	10	The *G* line from Dr. E. Nilsson	6 and 7
,, ,,	11	The *F* line from Dr. E. Nilsson	5 and 6

These interchanges have all been found in untreated material. Each of the seven chromosomes has been found to be involved in one or more interchanges.

The crosses structural type 1 × structural type 2, structural type 1 × structural type 9 and structural type 2 × structural type 9 all have a ring of four chromosomes at meiosis. It is therefore clear that, although the chromosomes concerned in the two interchange types 2 and 9 are the same, a different combination of segments is involved. Moreover, since neither of these lines has a dicentric (double