to 6 seconds. The conditioned stimulus for 2 of the lambs was the sound of a buzzer. For the others it was the sound of the metronome beating twice per second. The conditioned reflex appeared in the 6 animals after 3 to 7 combinations of sound and shock and became relatively stable (11 or more positive conditioned responses in succession) after 18 to 43 combinations. The development of a conditioned reflex of the type described and a simple maze habit exhibit a common characteristic. Both show a period of instability between the first appearance of the new response and the final, more or less stereotyped, reaction.

The most interesting feature of the formation of the conditioned reflex was the concentration of the motor response with increasing training. At first, the reaction involved a widespread activity of the skeletal musculature. The leg receiving the shock might be extended instead of flexed as the animal struggled in the harness. Later, and usually before the conditioned reflex was stable, the response was gradually concentrated in the leg stimulated by the electric current and the sound now evoked a brief and precise leg movement. The reaction of the other skeletal muscles at this stage served to give the body a posture in which the foreleg could be vigorously flexed.

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Note on Tea as a Source of Vitamin C.

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With the exception of cabbage and lettuce the leaves of plants have not been examined quantitatively for their content of vitamin C. The observations of Miura[1] indicated that different kinds of tea possessed widely different amounts of vitamin C, and the quantity found in green tea compared favorably with the content of the usual anti-scorbutic foodstuffs. Fermentation and its accompanying oxidative changes are a part of the commercial processes of tea manufacture and it seemed desirable to confirm Miura's observations with the possibility of correlating the data with the accepted facts relative to the oxidative destruction of vitamin C.

[1] Miura and Tsujimura, *Proc. Jap. Assoc. Agr. Chem.*, 1924, i, 1; Miura and Okabe, *Publ. Assoc. Tea Merchants*, Feb., 1926.

A series of 300 gm. guinea pigs on Sherman's[2] basal ration (with equal weights of rolled oats and wheat bran) was used for curative tests. These animals gained their last 50 gm. of body weight on the basal ration plus a leaf of cabbage. After the latter was omitted scurvy developed in from 2 to 4 weeks. Due to too long a delay in initiating the curative regime some animals succumbed within a day or two after its beginning, and thus served, along with others by design, as controls. Other controls proved the prolonged adequacy of the basal ration plus cabbage. None of these animals appears in the tables.

Four kinds of tea were tested in the form of infusions and the results are given in the following table. The preparation of the tea infusion was carried out as uniformly as possible. Fresh infusions were made daily; distilled water and glass flasks were used. The infusions made would probably pass for fairly strong tea. Two gm. of tea were used for 100 cc. of boiling water. Directly after the tea was added the flame was turned out and the flask was shaken several times during the succeeding 5 minutes. At the end of that time the liquid was decanted from the leaves which had settled to the bottom. The volume was restored to 100 cc. and in order to secure complete consumption of the desired amounts the tea was slightly sweetened by the addition of 3 gm. of pure cane sugar to 100 cc. of the tea. The amount consumed was carefully observed and any liquid remaining unconsumed was subtracted and due correction was made in the records. Animals on the larger allowances of tea were often deprived of water at night to insure the prompt consumption of the next day's dosage.

The minimum daily curative dose of tea infusion (2%) from different teas appears to be as follows: Japan Green Pan Fired, between 10 and 15 cc. Japan Green Basket Fired, not less than 20 cc. Oolong, not less than 25 cc. Orange Pekoe, considerably more than 25 cc.

Presumably these differences may be related to the method of preparation rather than to differences in plants or in their habitat. In the preparation of green tea the leaves are dried without fermentation. Fermentation previous to drying results in black tea. Sauer kraut and ensilage are reported to be devoid of vitamin C probably for the same reason. The kidney tissue of some of the animals was kindly examined by the Department of Pathology. This Department reported cloudy swelling and did not consider the condition significant.

[2] Sherman, H. C., LaMer, V. K., and Campbell, H. L., *J. Am. Chem. Soc.*, 1922, xliv, 165.

TABLE I. *Amounts of Tea Infusions Necessary to Prevent Scurvy.*

Animal No.	Amt. Infusion Daily cc.	Days Fore-period	Gm. loss During Fore-period	Days of Curative Period	Gm. Change During Curative Period	Autopsy Findings.†
31	10[1]	24	8	50	+18	Discontinued. No scurvy. Complete cure.
29	10	19	37	34	+28	Died of pneumonia. No scurvy.
15	15	24	88	5	—46	Severe scurvy. Fore-period perhaps too long.
10	15	32	61	30	—59	Discontinued. No scurvy. Kidney degen.
7	15	25	38	59	— 5	Discontinued. Very mild scurvy.
12	20	21	81	52	+ 8*	No scurvy. Died of kidney disease.
22	10[2]	25	76	5	—36	Scurvy. Complicated with pneumonia.
19	10	23	31	4	—63	Acute scurvy. Necrosis of liver. Fore-period probably too long.
2	10	27	76	44	—75	Scurvy. Kidneys congested.
30	15	25	53	71	+63	Mild scurvy. Kidney degeneration.
27	20	28	2	43	+30	Mild scurvy.
4	20	25	74	18	—70	No scurvy. Lung infection.
43	15[3]	21	62	9	—48	Mild scurvy. Kidney degeneration.
37	15	25	81	18	—46	Severe scurvy.
36	20	48	5	11	—56	Severe scurvy but compl. with lung infec. Fore period perhaps too long.
35	20	29	30	18	—54	Mild scurvy. Kidney degeneration.
40	20	22	48	21	—37	Scurvy but joints not large.
38	20	19	51	28	—71	Marked scurvy.
41	25	25	54	26	— 8	No scurvy. Kidney degeneration.
11	10[4]	26	62	24	—36	Scurvy complicated by lung infection.
28	10	28	65	51	—68	Extreme scurvy.
24	15	30	+25	22	—112	Marked scurvy.
16	15	19	38	16	—90	Mild scurvy. Pronounced lung infection.
32	20	40	+22	43	—21	Anesthetized. Mild scurvy. Kidney degen.
18	20	22	99	7	—75	Severe scurvy.
21	20	30	25	12	—22	Scurvy.
3	25	19	68	7	—16	Severe scurvy.
25	25	25	53	16	—57	Severe scurvy.

*Gained 95 gm. during curative period but declined rapidly at end.

†With a few exceptions, as noted, all the animals died of scurvy unless other cause is indicated. The others were anesthetized for examination.

[1]Japan Green Pan Fired. [2]Japan Green Basket Fired. [3]Oolong. [4]Orange Pekoe.

In every-day nutrition, despite its fairly high content of vitamin C, green tea has limited value as an anti-scorbutic. It can not be used by children and should not be used by adults to replace natural food-stuffs which meet additional nutritive requirements. Tea is a never-failing item in the rations prepared for expeditions, military or otherwise, into infertile or difficultly accessible regions. It is not known how long the vitamin C of tea survives the condition of storage and shipment. Presumably vacuum packing might be advantageous.