for the culture filtrate. After 48 hours the potted plants, to which the culture filtrate had been added, had wilted. The controls were healthy even on the fifth day. The seedlings grown in water cultures wilted in 48 hours after transfer to the culture filtrate while those transferred to the nutrient medium remained healthy.

To determine whether the killing effect of the culture filtrate is specific for the tomato plant, cuttings of the following plants were placed in the culture filtrate: Selaginella sp., cotton, sunflower, garden bean, and mustard. All of these wilted in 48 hours.

The toxic element is not destroyed by prolonged boiling of the culture filtrate. It is not carried over in steam sterilization. A water extract of the residue from complete evaporation of the filtrate on a water bath, is still toxic.

It is apparent from these experiments that *Fusarium lycopersici* produces a thermo-stabile toxic element *in vitro* which, when introduced into tomato plants, produces typical wilt symptoms. Studies of the nature of the toxic element, of the mechanism of its effects on the host, and of other related problems are in progress.

[1] Smith, E. F., Bacteria in Relation to Plant Diseases, Vol. II, 1911.
[2] Clayton, E. E., *Am. J. Bot.*, 1923, x, 71-88.

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Organic Chlorides of Tissues and Possible Relation to Gastric Hydrochloric Acid Formation.

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Among the current theories for the chemistry of the gastric hydrochloric acid mechanism, there are none which allow for the production of the acid without a coincident *local* formation of an equivalent amount of alkali. Since there is no evidence that gastric tissue becomes alkaline during acid secretion, and since it would require an enormous concentration of chemical energy to separate HCl from an alkaline component, it seemed reasonable to develop a theory of gastric acidity production which would not labor under this assumption of local alkali formation. A chemical reaction which seems particularly probable in this connection is the hydrolysis of an alkyl halide, with the production of hydrochloric acid and the corresponding alkyl alcohol. $RCl + HOH \rightarrow HCl + ROH$. The theory we have formulated involves (1) the mobilization of an organic chloride ester in gastric tissue at the time of gastric activity, and (2) the hydrolysis of this chloride ester, possibly under the influence of a specific enzyme activity. The alcohol thus formed may be reabsorbed at once or it may remain in the gastric juice, to be absorbed later in the intestine. The organic chloride is thought to be synthesized at the time of gastric activity, possibly in gastric tissue, as it is needed, from sodium chloride and the alcohol, with the simultaneous production of alkali—$NaCl + ROH \rightarrow RCl + NaOH$—thus accounting for the alkaline tide accompanying gastric secretion. To avoid an apparent contradiction, let it be explained that the alkali production accompanying the synthesis of the ester, though simultaneous with the acidity production, is in no sense coincident with it. The two reactions probably take place at two remote places, and certainly do not occur in the same place. The feature of this theory is that it permits of the formation of any concentration and amount of hydrochloric acid from *neutral* reactants and with a neutral product.

The existence of enzymes in gastric and other tissues specific for the hydrolysis of chloride esters has been demonstrated and reported on in a preliminary report.[1]

The results on the search for organic chlorides in gastric and other tissues may be summarized thus:

(1) A standard method for the differential fractional extraction of inorganic (ionized) and organic (unionized) chlorides from tissues has been developed.

(2) It has been shown that the fraction of organic chloride in some common tissues is very considerable, amounting to 10 to 50 per cent of all the chloride present. Thus 500 g. of wet fundus mucosa (100 g. dried tissue) contains 0.7 g. total chloride of which 0.35 g. is organic chloride.

(3) The behavior of the organic chloride in aqueous solution has been studied. It was found to be hydrolyzed with the production of both acidity and ionized chloride. The production of the acidity and of the ionized chloride do not always run parallel, but the discrepancies are probably due to an insufficient degree of purity of material.

(4) The distribution of this organic chloride in five different tissues has been studied. The fundus mucosa contains almost twice as much organic chloride per given weight of dry tissue as do the other tissues studied. The following table gives the results for 100 g. of dry tissue in any case.

TABLE I.

	Total Chloride	Organic Chloride
Fundus	.65— .75	.29—.31
Pylorus	.50— .65	.18—.21
Intestine	.45— .55	.14—.18
Liver	.30— .35	.15—.16
Blood	.9—1.0	.09—.13

(5) A comparative study of the distribution of different types of chloride in the tissues of fed and starved dogs showed no significant variations.

(6) These results, it is thought, furnish strong support for the theory that the hydrolysis of organic chlorides plays an important rôle in gastric acidity production.

This is a preliminary report.

[1] Hanke, Martin E., *J. Biol. Chem.*, 1926, lxvii, 11-13.

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Postural Apnea in the Duck.

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Aside from the apnea which is produced in the duck by submergence or by pouring water over its nostrils, one can also obtain a complete cessation of respiration when the duck is held in the air in certain definite positions. This applies especially to the position of the head in space. We fully confirmed Huxley[1, 2, 3] and Paton[4] in that whenever the vertex of the head is directed downward, whether the body is in the prone or supine position, apnea ensues. Like Huxley, we observed a very marked slowing of the heart accompanying apnea.

If the duck is placed on its back, the neck will be curved so that the head is held in the air in normal position with the beak directed towards the tail (labyrinthine righting reflexes on the head). Under these conditions respiration is normal. When the head is bent backward so that the vertex is directed downward, respiration stops and the apnea continues as long as the forced position of the head is maintained. Occasionally the animal struggles for a moment or two and it appeared as if it might make some respiratory movements during the struggle. By connecting the head of the duck with the