of interfering with gaseous exchange, is under investigation.

This simple method has great practical utility, as its adoption will enable the farmer to reduce the cost of suckering or to do away with it entirely. The method may also enable the farmer to retain a larger number of leaves per plant without affecting their quality, as the buds are 'nipped' before they have any chance to develop into suckers. So far, all the varieties of tobacco tried, such as flue-cured (Harrison Special), bidi and cheroot, have responded uniformly to the treatment.

In addition to petroleum jelly, various mineral oils and fats, both of animal and plant origin, have been tried and found to suppress buds in varying degrees. Further investigation is in progress.

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Concretions in the Pyloric Gland of *Ciona intestinalis*

THE pyloric gland has long been known to exist in ascidians and is recognized to be of general occurrence in the tunicates with the exception of the Larvacea, but its function has not been determined with certainty. The organ usually forms a system of branching and anastomosing tubules enveloping the rectum and part of the intestine, and opening into the gut between the stomach and the intestine by a single duct. Varicose swellings in the tubules are found in many genera. Chandelon¹, Isert², Sokólska³, and van Weel⁴, among others, believed the pyloric gland to be digestive in function, contributing enzymes to the intestinal contents. They based their conclusion on the presence, in the walls of the tubules, of vacuoles which discharge into the lumen of the tubules. Todaro⁵, Colton⁶ and Azéma⁷ were among those who regarded the pyloric gland as an excretory organ.

Chandelon recognized solid refringent bodies in the terminal ampullæ of the gland in *Perophora*, and Isert found similar bodies in varicose swellings of the tubules in *Microcosmus*. Azéma also described concretions in the pyloric gland of *Dendrodoa*, *Ascidia* and *Ascidella aspersa*. During the course of work on *Ciona intestinalis*, I have examined the pyloric gland, which was always found to contain solid bodies in the lumen of the tubules. These bodies occurred in most of the varicose swellings of the tubules either as a simple sphere or an aggregation of bodies of different sizes. The smallest spheres are solid, whereas the larger ones are apparently hollow shells. Throughout the life of the animal these bodies increase in number and size. When examined through crossed Nicol prisms, they appear bright with a black cross and are probably crystalline concretions built up in concentric layers. Chemical analysis of the concretions has not yet been attempted; but their physical structure suggests that they may be laid down as solid excretory products derived from the liquid secretion of the walls of the tubules.

It is of interest that a number of ascidians possess renal vesicles in which crystalline concretions of lamellar structure are deposited. *Ciona*, however, is among those ascidians which lack renal vesicles, and although nephrocytes in the blood appear to be

responsible for some excretion, it is possible that the pyloric gland is the main excretory organ in *Ciona*.

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Formation of Melanin in Regenerating Limbs of a Crustacean

THE pigmentation of the isopod crustacean *Asellus aquaticus* is chiefly due to a melanin¹ distributed in granular form in the cytoplasm of stellate cells of the usual arthropod-type, underlying and interpenetrating² the epidermal cells. The newly eclosed regenerating limb is macroscopically unpigmented, and is very conspicuous. Microscopically, incipient pigmentation is sometimes visible, and otherwise becomes evident in a day or two, as golden-brown granules, in the cytoplasm of large wandering cells (17 μ or larger), at the time when these presumptive pigment cells first begin to assume their definitive position, and their asteroid form. These large wandering cells are a conspicuous feature of the newly eclosed limb, and decrease in number as pigmentation progressively develops, during the stadium following eclosion.

If newly eclosed regenerating limbs be amputated and placed in neutral³ 1 per cent aqueous solution of 'Dopa', a visible dopase reaction appears, in half an hour, in the previously unpigmented wandering cells, and in cells in the early stages of fixation, at first near the fractured end of the limb, and afterwards spreading along. A black melanin is deposited within the cells (see photograph), which would thus appear to contain a specific concentration of an enzyme of the dopase group. Moreover, as in the ontogeny of animals (cf. ref. 5, p. 1,381), the active enzyme would seem to forestall the substrate, and regeneration might be said to recapitulate ontogeny.

Eventually, the 'Dopa' deposits as melanin in other tissues; first in the muscle fibres (see photograph), which become functional at eclosion, then in other cells of the blood⁴, and eventually in the nuclei of the muscle syncytia and of other tissues. The epidermis is probably the least susceptible tissue, though the tonofibrils anchoring the muscles to the exoskeleton become impregnated. Exuviae become