Marsh grapefruit, Sultanina graps and some Chinese persimmons it is rare in watermelon and American cucumber and has not been reported in peppers.[4, 5]

An experiment was conducted by the writer during the summer of 1938 with the National Pickling variety of cucumber, in an attempt to secure seedless fruits with normal shape by means of growth-promoting substances. There were 8 series of experiments. All the treated blooms were covered with wire cages before anthesis as well as 4 to 6 days after treatment in order to avoid contamination. It was found that natural parthenocarpy occurs in this variety, but the occurrence is very rare. Naphthalene acetic acid caused parthenocarpic fruits either when applied in lanolin paste of 1 per cent. to 5 per cent. concentrations or as a 0.05 per cent. aqueous solution. The percentage of fruit set in hormone-treated flowers was higher than from self-pollination.

With watermelon, eleven varieties were used. Both indolebutylic and naphthalene acetic acids (NAA in short) were used. These were applied as 1.0, 2.5, and 5.0 per cent. concentration in lanolin paste and as a NAA 0.05 per cent. aqueous solution. Twelve different treatments were used. No parthenocarpic fruits were formed except from blossoms treated with NAA. Fruits were induced to set by treating the cut style in all concentrations of lanolin paste and possibly in aqueous solution. Hormone-treated watermelons were perfectly seedless but varied in fruit shape. In general, the hormone-treated fruits were more or less triangular in shape, some even resembling the Table Queen squash rather than watermelon. Some, however, were normal in shape and size. The texture of these fruits was very solid and firm. No differences in flavor could be detected from normally pollinated fruits.

The seed of three plants of the Winter Sweet watermelon had been subjected to colchocine treatment before planting. The plants showed a typical colchicine effect, *i.e.*, stunting early in the season, large size of leaves and flowers and great vigor later in the season. Although pollen was present in great abundance, it failed to induce fruit setting when the blossoms were selfed. On the other hand, hormone-treated flowers set very satisfactorily. Fruits were formed in some open-pollinated flowers (with plenty of seeds), probably due to fertilization from nearby normal plants (vicinism).

Very satisfactory results were obtained in pepper of the Harris Wonder variety, both by using 1 per cent. of NAA in lanolin and spraying with 0.05 per cent. aqueous solution.

A detailed report will be published elsewhere in the near future.

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[4] H. A. Jones and J. T. Rosa, "Truck Crop Plants," p. 437, 1928.

[5] R. Wellington and L. R. Hawthorne, *Am. Soc. Hort. Sci. Proc.*, 25: 97–100, 1929.

## SHORTENING DAYLIGHT PERIODS BETWEEN MAY 15 AND SEPTEMBER 12 AND THE PELT CYCLE OF THE MINK[1]

ONE of us[2] found that the pelt cycle of the ferret (*Putorius vulgaris*) is conditioned by length of day in correlation with the sexual cycle under the control of the hypophysis. This cycle was controlled and modified by manipulating the daily period of light to which the animals were exposed.

In a rather crudely and irregularly carried out experiment last summer, mink (*Lutreola vison*) were used as experimental animals, to see if this nearly related animal was responsive in the same way. The experiment was carried out in a cellar, where the temperature was not controlled and varied with the season but within somewhat narrower limits than that outside in the full light of day.

Controls consisted of about fifty mink of both sexes kept in the usual type of pen outside in the daylight and fed and cared for in the usual way. Some had distemper and some had not. Experimental animals consisted of four males and twelve females kept in the cellar in cages similar to those of controls. None of them had the distemper and all remained in good health and condition throughout the experiment. They were introduced into the cellar at four different times between May 15 and June 16.

By closing light-tight shutters over the two windows of the cellar, the light-time each day was gradually reduced from May 15 to June 23; increased gradually until July 26, because nothing seemed to be happening to the first animals introduced. It was then gradually reduced again until September 12. This second reduction was given because on July 26 it was noted that three of the animals (2 ♂♂ + 1 ♀) were in the condition of fur normal for the first week of October. They were shedding summer pelt and growing winter pelt from the tails forward. All experimental animals were removed from the cellar and returned to normal daylight on October 24. For two weeks, beginning on August 22, one male and one female that seemed to be slow to change pelt were placed in a refrigerator for from one-half to two hours each second day to see if

[1] Aided by grants from the National Research Council, Committee for Research in Problems of Sex, 1937–38, and the Penrose Fund of the American Philosophical Society, 1938–39, administered by T. H. Bissonnette.

[2] T. H. Bissonnette, *Anat. Rec.*, 63 (2): 159–168, 1935; *Quart. Rev. Biol.*, 11 (4): 371–386, 1936; *Endocrinology*, 22 (1): 92–103, 1938.

reducing temperature would hasten their reaction or improve their winter pelts. All animals were fed the usual summer diet of red meat (until September 15).

Controls put on winter prime pelts at the usual time in October and early November or later, whether they had distemper or not.

Six of the experimentals reached normal winter prime pelt before September 18, except for slight reddish color due to the red meat diet: one female before August 17, the hottest of summer time; two others before September 1 and 6; two males before September 12 and one before the 18th. Another female barely failed to complete prime coat before September 12 and two others (♂ + ♀) loosened summer fur but failed to grow winter pelt except on the tail. Refrigeration may perhaps have helped one male slightly toward prime coat; but it was completely ineffective with the female similarly treated.

Other experimental females failed to show any change of pelt except to have a few hairs become loose in September and October and failed to assume prime winter pelt even at the usual time before November 7. They were apparently rather drastically upset by the irregular changes in length of day just about the time they were beginning to become responsive.

It is, therefore, indicated that the assumption of winter prime pelt by mink may be induced in summer in spite of relatively high temperatures or hastened in autumn by reducing the duration of the periods of light (and/or its intensity) to which the animals are exposed daily. Reduced temperature is, apparently, at most, a minor factor in this reaction.

The complete experiment will be described in detail elsewhere.

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# SCIENTIFIC APPARATUS AND LABORATORY METHODS

## A GLASS AND RUBBER LABORATORY PUMP

THE pump to be described here is a modification of one designed by Palmer.[1] Like Palmer's, it is operated by compressed air, and the fluid being pumped is in contact with glass and rubber only. It has the added advantages of greater capacity—1,500 cc per minute against a pressure of over a meter has been attained—and of operating in any position.

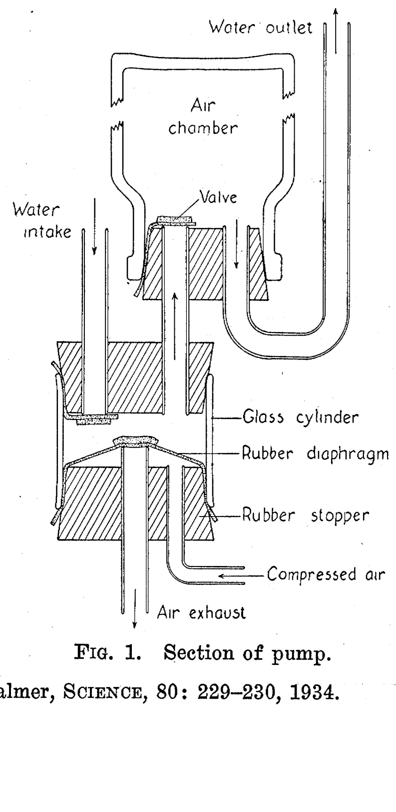


FIG. 1. Section of pump.

1 J. Palmer, SCIENCE, 80: 229–230, 1934.

The construction is shown in Fig. 1. The cylinder is made of a piece of Pyrex tubing with an internal diameter of two inches. Considerable strength is necessary, but for pumps built on a smaller scale Pyrex need not be used. The diaphragm and valves are of rubber dam about 1/40 inch thick. They must not be stretched too tightly. *Ecru* dam should be used; the "buckskin" rubber dam popular with dentists fails after two or three weeks. The life of these parts is increased by attaching with rubber cement a small piece of rubber (*e.g.*, inner tube) to the diaphragm and to each valve, as shown in the figure. The ends of the tubes over which the valves and diaphragm fit should be ground to an even rim and fire polished. All stoppers must be wired in place.

A head of water (or of whatever fluid is to be pumped) is necessary at the intake. This fills the cylinder, pressing down on the diaphragm, and passes up through the air chamber and outlet tube to a height equaling the head at the intake. When the compressed air is turned on, the diaphragm is lifted, closing the intake valve and driving the water through the outlet, but the weight of the water, opposed only by atmospheric pressure in the exhaust, holds the diaphragm against the end of the exhaust for some time. Finally, the increasing pressure below the diaphragm lifts it off the exhaust, allowing the air to escape and the diaphragm to fall. As it falls, the cylinder is refilled through the intake, the exhaust is closed, and the process starts again. Each cycle moves only three or four cubic centimeters of water, but the pump operates at about six strokes per second. The flow of compressed air must be carefully adjusted by a clamp close to the