collected an a canvas sheet spread on the ground beneath a holly tree 10 feet high. Some idea of the larval population was gained by digging in that area during February of this year (1941) when 50 to 60 larvae per cubic foot of soil were found in some parts of the orchard. The rapid increase or high population potential is largely explained by the fact that the weevils are parthenogenetic.

Control :— Where grafts are subject to attack on standard trees the control of this flightless weevil is simple; it is sufficient to grease-band the tree trunks. On bush trees and apple stocks the pest can be completely controlled by painting the grafts with arsenate of lead paste, applied with a brush. The paint must be applied soon after the grafts are tied, because the weevils feed quickly, and comparatively few will destroy numbers of grafts in a short time.

When the weevils persist in plantations of raspberries, strawberries, holly, etc., it is advisable to cultivate the ground thoroughly in March to disturb the pupae and newly formed weevils, and to spray the foliage with lead arsenate.

Experiments conducted at the Victoria laboratory during 1938 showed that an apple pomace bait containing 5 per cent sodium fluosilicate was highly successful as a control against the adults.

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TWO UNUSUAL LARVAL HABITATS OF TABANIDS (Diptera)

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All the records I can find of larval habitats of tabanids (Horse flies) state that the larvae are aquatic or semi-aquatic. A. E. Cameron, in his "Bionomics of the Tabanidae (Diptera) of the Canadian Prairie" states, on page 14, "Lutz (1922) who has made extensive studies of the *Tabanidae* of Brazil, argues that because he has not observed oviposition on plants, the eggs may possibly be laid on the ground or in other places where they are not apparent. So far as the *Tabanidae* of the prairie are concerned, this contingency appeals to us as being somewhat remote, especially as the larvae are always found in close association with an aquatic habit and never in dry soil distant from water. In those species in which the egg-laying habits are known, the eggs are invariably laid so that the larvae on hatching immediately fall into the water, in which they may either remain or sink into the mud below. Oviposition in the soil, on the other hand, seems so contrary to the prevailing, almost semi-aquatic habits, that the co-existence of two such divergent modes of behaviour within the limits of a family, the habits of which are so uniform in other respects, is improbable. Further, the soil would appear to offer to the newly-hatched larvae a medium less suited to its delicate structure than mud and water."

In view of the above, it was of considerable interest to me to find the newly-formed, soft, white puparium of a tabanid under a small stone on the ranges north of Kamloops, B. C. This was found on June 1, 1937, at an altitude of 3,250 feet on a hillside above Lac du Bois, some 150 feet above and 200 yards from, the surface of the lake. The range was heavily overgrazed and dry as only the Kamloops ranges can become dry. True, the soil immediately under the small stone was damp or perhaps better described as being less dry than the surrounding soil, but on the arched shoulder of steep hillside the drainage was so complete that in no sense could the soil have been called moist. The puparium was very gently shovelled into a tin collecting box with about three heaping tablespoons of the soil in which it lay, and was set aside for observation in a dark corner of the field laboratory. Exactly one month afterwards, on July 1, there emerged a perfect specimen of *Tabanus punctifer* O. S.

It is extremely unlikely that the larva developed on the shore of the lake and at maturity, crawled up a dry hillside, rising 150 feet in 200 yards, to pupate under a small stone. Stones on that part of the range were few and far between. On the other hand, if the larva pupated where it developed, the question arises "Where was the egg laid if not on the soil or on the scanty overgrazed grass stems in the vicinity?" Tabanid larvae are reported as being predaceous and it is doubtful if this one found enough insects or insect larvae straying under its stone to raise it to maturity so it must have wandered about in the very dry soil all around.

On another occasion on these same ranges I captured two adults of *T. punctifer* on a fence, set about 50 yards up a 60° slope above a small range pool. The hillside was rough and gravelly and very dry. The flies were so newly emerged as to be drowsy and I picked them off by hand. At the time of capture I made a note that it seemed very unlikely that the larvae had matured on the edges of the pool and had migrated up such a steep rough hillside to pupate, and that it seemed likely that they had developed at the base of the fence post.

The second unusual habitat record I wish to report on was a grub taken from the shore of Coal Harbour, on the Stanley Park side, at Vancouver, B. C. It was collected by a team of students doing marine quadrat survey work on the sea beach at unusually low tide and was found a couple of inches down in the sand. The animal was given me by John Davidson, Jr., whose students found it and placed it in a jar of sea water. I left it in the jar of sea water for three days and then introduced enough clean rain-washed sand to leave a small wet bank up the side of the jar. The grub moved exceedingly slowly and very little and finally pupated in the damp sand bank. There was no indication as to the family it belonged to because it was a curved cylinder, equally blunt at both ends and was covered with a dense coat of moss-like debris. Later on I discovered the last larval skin and had to soak it in caustic potash before this debris came away, revealing a typical tabanid larval exuviae. Certainly when alive, the larva looked absolutely unlike that of a typical tabanid; I had no idea what it was. After about a month there emerged a dull brown fly, which has been identified by Dr. C. B. Philip as "*Hybonitra n. sp.?*"

As far as I can determine, this is the first record of a marine tabanid whose larva developed at a point on the sea shore uncovered by sea water except at low tide.

From a table of sea water determination from 12 stations in Coal Harbour and Burrard Inlet, I cite two records taken from the area where this larva was found in Coal Harbour.

Date	*Hour*	*Depth*	*Temp. °C*	*Chlorinity*	*pH*	*Tide*
Aug. 11	7.30 p.m.	Surface	14.75	13.54	8.15	1st ebb
Aug. 7	10.30	Surface		14.28	7.85	Full ebb

Now the highest chlorinity (salinity) of any station in local waters registered 14.47 whereas that of Siwash Rock area, where the Fraser River water comes in, ran down to 2.94; so these readings for Coal Harbour, of 13.54 and 14.28, showed a high degree of saltiness in the area where the larva was taken, proving an adaptation to, or a necessity for, real marine conditions, and precluding the chance occurrence of a solitary individual in this habitat.

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I am indebted to Mr. John Davidson Jr., for giving me this marine tabanid larva, and to Professor Andrew Hutchinson of this University for the table of water determinations in Coal Harbour.

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HOST IMMUNITY TO TICKS (Acarina)

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Recent papers on acquired immunity to ticks by William Trager (1, 2 and 3), recalled to the writer a similar experiment that he performed at the Dominion Entomological Laboratory at Kamloops during the autumn of 1936. The results were not published at that time, as the experiment was merely preliminary to further work planned. However, in view of the re-