"balloon" or greatly expanded wing. It is also conceivable that the characters 58.7 and 59.5 of the IIIrd Chromosome yielding the "bithorax" may have developed into a tri-thorax and yielded a triple wing. But why on one side only? Except for these two points, I can find no gene that is responsible for a replication of features; all the others produce a change of some sort, morphologically, or only a color change.

Acknowledgement

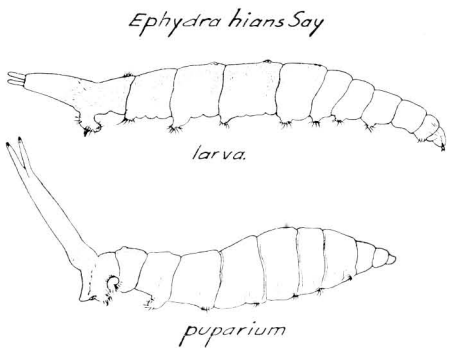
I am indebted to Dr. G. E. Shewell of the Division of Entomology, Ottawa, for giving me the specific name of this fly.

It is of interest to note that up to the time of my sending specimens for identification, the only ones in the National Collection were the type and paratype; in the summer of 1937 thousands of these flies occurred on the Kamloops hills. The summer of 1938 was very dry, **Balsamorhiza** had dried up by the time I arrived and the flies were entirely absent.

A NOTE ON BRINE FLIES IN BRITISH COLUMBIA
(Ephydridae: Diptera)

by Ivor J. Ward
Science Service, Dominion Department of Agriculture

In various parts of the area north of Clinton, B.C., such as east of 100-Mile House on the Cariboo Road and westwards along the Chasm-Jesmond road, occur several so-called soda lakes whose white crystalline shores are conspicuous as far as they can be seen. In several instances the deposits from these lakes have been harvested as commercial ventures and the remains of loading machinery and wharves may still be seen, heavily encrusted with white crystals.



One such lake occurs along the road leading from past Carr's Ranch towards Canoe Creek. The lake is apparently subject to considerable fluctuations in level over periods of years because it was once very low and encircled by trees, then some ten feet higher, and the salt killed the trees; at present it is low again and dead trunks stick out from the edges of the alkali like sentinels, heavily encrusted with white crystals.

Passing by this lake on August 25th, 1937, in company with Mr. J. K. Jacob, who was collecting Diptera at the moment, we noticed that

the masses of crystalizing salt on the edges of the "thick" water and especially the damp masses of salt all over the timbers of the abandoned elevators and chutes, were plastered with puparia of a brine fly; the small amount of water that occurred between the chunks of salt in a state of almost supersaturation, was thick with wriggling larvae. Over the whole white shore line, over the masses of salt and even on the surface of the water, moved a swarm of small flies.

This is the so-called Brine Fly, **Ephydra hians** Say of the family Ephydridae, whose members are sometimes very common around marshes and decaying swamps. This species is dark gray with a greenish front and is considerably larger than the average for the family. Aldrich records that its larvae occur in such vast numbers in Mexico that the Indians used to collect them for food known as Koo-tsabe. It has since been recorded in literature several times from the Western States.

As far as I can determine it has not hitherto been brought to the notice of this Society and since it is of such unusual habitat and is so enormously plentiful in these Cariboo lakes, I have prepared this note about it. If Entomologists have not mentioned it in this Province, those engaged in the commercial extraction of soda have commented on it for many years. Specimens were sent down from this area in 1926 to the University for identification, along with a large mass of crystals and empty puparia. When the salt was diluted down and filtered, a surprising amount of minute globular bodies, probably algae, was obtained which were not normally noticeable among the salt crystals. Chemists who analyzed the deposits at the time, observed and remarked on these flies.

On account of its remarkable habitat, the insect is of considerable interest. The tiny, white, curved eggs of allied species (so probably of this species) are laid directly in the brine and the larvae develop entirely in this medium which Dr. W. Seyer of the department of Chemistry at the University informs me, is 99.5 percent pure sodium carbonate, practically in a saturated condition, with traces of other salts making up one half of one percent. Early stages of the larvae are not to hand but the mature maggots are of unusual shape. The segments are equipped with prolegs, tipped with double sets of claw-like, short setae. The two posterior pairs are opposable, forming an effective grasping mechanism. There is a caudal breathing extension, terminated by two short and apparently extrusible, finger-like respiratory processes from which two tracheae run forward to about the middle of the body. (See accompanying sketch). The mouth hooks are typically dipterous and the question arises as to the food of these maggots. They cannot subsist upon pure sodium carbonate! From examination of the stomach contents, Mr. Spencer has suggested that the larvae may feed upon the globular algae so abundant in the brine and that this feeding is effected by the larvae grasping the algae with the anal pro-legs and rasping it with the mouth hooks. I have had no opportunity of checking this suggestion.

The puparium is but little changed from the mature larva except that the anal extension is nearly doubled in length and the finger-like projections are longer and are permanently protruded. Pupae may of-

ten be seen attached to particles of wood or even to the breathing tubes of one another, by the grasping mechanism of the anal pro-legs.

Acknowledgement

I am indebted to Professor G. Spencer for certain assistance with this paper and for getting the analysis of the salt from Dr. Seyer.

Also to Dr. G. E. Shewell of the Division of Entomology at Ottawa for verifying our tentative identification of this fly.

A PRELIMINARY LIST OF THE BIBIONIDAE OF BRITISH COLUMBIA AND SOME LOCALITY RECORDS

by J. K. Jacob
Vancouver, B.C.

The **Bibionidae** or March flies are slender flies of small to medium size. The adults are frequently very common, sometimes being attracted to blossoming fruit trees, particularly the Pomes. The name "March flies" has been given the family in this country because of the frequent occurrence of some species in large numbers during the month of March, at which time they attract considerable attention.

The very primitive larvae are dark colored, tough, and with well developed heads. They are often gregarious and feed on decaying vegetable matter, manure, or on the roots of grasses, grains, vegetables, and other plants.

Until very recently little systematic work in North America has been done on the Bibionidae. The first notable effort was made by W. L. McAtee in 1921. Later, in 1936, M. T. James published a paper entitled "Some New Western Bibionidae." A large number of short papers have also been published in recent years. During the last two years a complete revision of the known North American Bibionidae has been made by D. E. Hardy of the Utah Agricultural College from which much of the material for this paper was taken.

The family is separated from all other Dipterous families by the following characters: antennae composed of eight to twelve segments and placed below the compound eyes, usually close to the oral margin; eyes separated; ocelli present; mesonotal suture transverse; costa vein ends at or near the wing tip; discal cell absent; tibial apical spurs present.

Characters of wing venation and of the tibiae are used in separating the genera. Of the seven genera listed in Curran's "North American Diptera" six are recorded for British Columbia.

In this list there are recorded 30 species and 5 varieties together with their distribution. The records are those of numerous collectors and were obtained principally from the Canadian National Museum, D. E. Hardy, C. Garrett, the University of British Columbia and my own collections. Therefore few of the specimens whose records are listed below are in my own or in the University collection.

I wish to thank especially Mr. G. E. Shewell of the Division of