

great alarm. Emergence was from cracks in the asphalt around a small concrete office. The manager mentioned that timbers from large wooden buildings formerly on the site, were buried under the present office so the

flood of beetles must have come from this rotting wood. Like the swarms of *Lasius niger*, the presence of these insects is an effect, the result of sodden wood and not the cause of wood decay.

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DISTRIBUTION OF STORED FOOD INSECTS IN BRITISH COLUMBIA¹

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This is a report of a continuing survey of grain elevators, cereal warehouses, and flour mills in British Columbia for the seven years 1952 to 1958, to determine the distribution and relative importance of established stored food insects.

A few reviews have been published on these pests in British Columbia. Follwell reported on the Ptinidae in cereal warehouses (1952) and issued a circular on stored product insects and their control (1953). King (1953) assembled some information on these pests and Gray (1953-56) listed the ones most commonly found. Spencer (1942) recorded some of the common forms occurring in dwellings.

The present survey consisted of visits to establishments in the large centres in the province, from Vancouver to Cranbrook in the south and to Prince George in the north. On Vancouver Island warehouses were inspected from Victoria to Courtenay and Port Alberni. In the interior and on Vancouver Island inspections were made during July or August only, but on the lower mainland they were made throughout the year.

An inspection consisted of a check of the premises for crawling and flying insects and an examination of the stored food in sacks and in bulk. Some specimens were obtained by screening samples. The insects taken were often brought to the laboratory to be reared and questionable specimens were submitted to the Systematics Unit, Ottawa, for identification.

A total of 584 visits was made to establishments during the seven years, in which 35 species of insects were recorded:

Year	Firms visited	Species
1952	101	21
1953	108	25
1954	80	16
1955	76	17
1956	40	14
1957	97	20
1958	82	19

In many cases the same species of insects showed up year after year in the same premises. Table 1 shows that the most widespread insects were: the Australian spider beetle, *Ptinus ocellus* Brown (*P. tectus*); yellow mealworm, *Tenebrio molitor* L.; black carpet beetle, *Attagenus piceus* (Oliv.); and the granary weevil, *Sitophilus granarius* (L.). Other insects of prime actual or potential importance under all B.C. conditions are: cadelle, white-marked spider beetle, saw-toothed

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grain beetle, confused flour beetle, Mediterranean flour moth, Indian meal moth, meal moth, brown house moth, white-shouldered house moth. These insects are not necessarily widespread in the province, but when found are usually in large numbers and are capable of rapid build-up. Frequent treatment is required to keep the numbers down.

Pests of lesser importance in the province, with the possibility of serious outbreaks, are: drug store beetle, rusty grain beetle, varied carpet beetle, larder beetle, hide beetle, black flour beetle, broad-horned flour beetle, tobacco moth, *Aphomia gularis* (Zell.), booklouse, grain psocid, grain mites.

A third group follows, of local importance by reason of comparatively

low reproductive rate, unsuitable climate or restricted food range: rice weevil, carpet beetle, *Trogoderma simplex* Jayne, fungus beetle, bean weevil, *Pseudeurostus hilleri* (Reit.), golden spider beetle, hairy spider beetle, globular spider beetle, Angoumois grain moth, European grain moth.

The numerous occurrences recorded at Vancouver and Victoria reflect the size and diversity of the food industry in these cities. Most of the species listed are cosmopolitan, but some (e.g., *P. ocellus*), though widely distributed, are confined to the temperate regions of the world. The table gives no indication of the intensity of the infestations, since considerations of time and travel did not permit quantitative assessments. These are

TABLE I.—Distribution of stored food insects by towns and cities in British Columbia, from 1952 to 1958

COLEOPTERA			
Anobiidae	<i>Stegobium paniceum</i> (L.)	drug-store beetle	
Cucujidae	<i>Cryptolestes ferrugineus</i> (Steph.)	rusty grain beetle	
Curculionidae	<i>Sitophilus granarius</i> (L.)	granary weevil	
	<i>S. oryza</i> (L.)	rice weevil	
Dermestidae	<i>Anthrenus verbasci</i> (L.)	varied carpet beetle	
	<i>A. scrophulariae</i> (L.)	carpet beetle	
	<i>Attagenus piceus</i> (Oliv.)	black carpet beetle	
	<i>Dermestes lardarius</i> L.	larder beetle	
	<i>D. maculatus</i> Deg.	hide beetle	
	<i>Trogoderma simplex</i> Jayne	
	<i>Mycetophagus quadrigitatus</i> Mull.	fungus beetle	
	Mylabridae	<i>Acanthoscelides obtectus</i> (Say)	bean weevil
	Ostomatidae	<i>Tenebroides mauritanicus</i> (L.)	cadelle
	Ptinidae	<i>Pseudeurostus hilleri</i> (Reit.)
<i>Niptus hololeucus</i> (Fald.)		golden spider beetle	
<i>Ptinus fur</i> L.		white-marked spider beetle	
<i>P. ocellus</i> Brown		Australian spider beetle	
<i>P. villiger</i> (Reit.)		hairy spider beetle	
<i>Trigonogenius globulus</i> Solier		globular spider beetle	
<i>Oryzaephilus surinamensis</i> (L.)		saw-toothed grain beetle	
Silvanidae		<i>Tenebrio molitor</i> L.	yellow mealworm
		<i>Tribolium confusum</i> Duv.	confused flour beetle
		<i>T. destructor</i> Uytt.	black flour beetle
	<i>Gnathocerus cornutus</i> (F.)	broad-horned flour beetle	
LEPIDOPTERA			
Phycitidae	<i>Anagasta kuehniella</i> (Zell.)	Mediterranean flour moth	
	<i>Ephesia elutella</i> (Hbn.)	tobacco moth	
	<i>Plodia interpunctella</i> (Hbn.)	Indian meal moth	
Pyralididae	<i>Aphomia gularis</i> (Zell.)	
	<i>Pyralis farinalis</i> (L.)	meal moth	
Oecophoridae	<i>Hofmannophila pseudopretella</i> (Staint.)	brown house moth	
	<i>Endrosia sarcitella</i> (L.)	white-shouldered house moth	
Gelechiidae	<i>Sitotroga cerealella</i> (Oliv.)	Angoumois grain moth	
	<i>Nemapogon granella</i> (L.)	European grain moth	
PSOCOPTERA			
Liposcelidae	<i>Liposcelis divinatorius</i> (Mull.)	booklouse	
Atropidae	<i>Lipinotus patruelis</i> Pearman	grain psocid	

established in the south-western U.S. It has not yet appeared in B.C. nor is it likely to become established because the climate is unsuitable (Howe and Lindgren 1957).

Acarina are of economic importance at the coast, especially *Acarus siro* L. However, mites are not included in this list since they are seldom important away from the coast, and because they cannot be recognized on sight.

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The Collection of Coleoptera in the Department of Zoology, University of British Columbia

When I arrived at this University in the Autumn of 1924, I set out to build three collections of insects: first, a systematic collection representing all Orders occurring in the province; second, a synoptic collection for teaching; and third, a demonstration collection of insects of economic importance. It soon became evident that the systematic collection was the first essential, so skeleton collections only were made for teaching and of economic insects, and I concentrated on taking every insect of nearly every Order that I came across every Saturday afternoon and Sunday during summer months or whenever else I found them throughout the year.

At that time there were available in the Province, for reference, the Hopping collection of Coleoptera and the Buckell collection of Orthoptera at Vernon, the Blackmore collection of Lepidoptera and the Downes collection of Hemiptera-Homoptera in Victoria and the Glendenning collection of aphids at Agassiz. So I took no Lepidoptera, but concentrated on the smaller Orders, collecting only those beetles and bugs that I happened to find without actually hunting for them.

The late Kenneth Auden, a student in his fourth year in 1924, was a very keen coleopterist and gave me what he called "trash", namely duplicates of a few common species

of which he had large series and these constituted the beginning of the beetle collection.

In time I had accumulated some 26 Schmitt boxes of beetles so that when Mr. George Hopping was loaned to the University by the Federal Government in the winter of 1945-46 to lecture in forest entomology, he spent seven months arranging the beetles into two 18-drawer cabinets and one cabinet of duplicates. He also added some specimens from his father's collection to fill conspicuous gaps in the University collection, chiefly of representative species from outside this province.

Meanwhile I kept on collecting. In the post-Hopping years, much of the material was identified by Professor M. H. Hatch of the University of Washington, Seattle, and more latterly by Mr. Gordon Stace-Smith of Creston who probably has the most extensive collection of B.C. beetles extant.

To these three specialists I owe a great debt of gratitude and offer my sincerest thanks.

No one, however, has been a better entomological friend to our University than Hugh B. Leech, formerly of the Division of Forest Insects, Vernon, but now in charge of the immense collection of Coleoptera at the California Academy of Sciences, San