the same time almost to the minute, is rather remarkable under confinement.

An attempt to mate the moths was unsuccessful. As this species is apparently single brooded, it is possible that mating would be delayed until the following spring, as the female *meadi f. badiaria* from which the ova were obtained was very worn and minus a hind wing, evidently a hibernated specimen.

TWO DECADES OF HOUSEHOLD PESTS IN VANCOUVER: A SUMMARY OF ENQUIRIES

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There are certain unavoidable imperfections in these records.

1. Citizens of this Province and of Vancouver have been slow to realize that they can get a measure of help from the University in connection with their insect problems.
2. Many enquiries have come in and have been answered over the telephone: only in later years have some of these messages been recorded.
3. Those recorded have been mostly letters sent to enquirers, of which carbon copies are on file.
4. While 95 per cent. of these records are from Vancouver, I have purposely included some from other points in the Province to show the spread of an insect or its distribution.
5. Most of the enquiries come in during the summer months when I am away on field work.

With the University becoming better known, the volume of enquiries is steadily increasing until now they average 30 to 40 per month throughout the academic year. Some of these enquiries sent to The Entomologist, credit me with encyclopedic knowledge; some I can hand to other members of our Department, but the rest I have to answer. Samples of these are:—

Types of questions sent in to an Entomologist

How to remove moss from roofs.
What rotifers occur in moss on roofs?
How to prevent woodpeckers drilling in roofs and pigeons from fouling cornices.
Will carpenter bees in nail holes in walls and between shingles on roofs destroy the house?

Concerning insects brought into houses on cut flowers or leaves, aphids, thrips, blotches on holly leaves, borers in rose stems, *Leptoglossus* on holly, aphids and scale on ferns.

Odd insects flying in, esp. *Polyphylla crinita* Lec.
Horn-tails being attracted to gas works.
During war years, "how to raise silk?"
How to remove toads, snakes and moles from gardens.
How to tell sexes of guinea fowl and muskrat.
How to remove flies and mites from mushroom beds.
Mites in honey-bee colonies and on earthworm cultures.
How to remove swarms of honey-bees from gardens.
How to rear frogs and toads and to start earthworm farms.
Why has a moose a bell?
Why are there no skunks in central B.C.? and so on.

Therefore the following records are cut down heavily to include only those affecting homes, in one way or another.

In view of the above-mentioned imperfections in these records, I can give you only an *idea* of what household pests occur in Vancouver; it is at best, only an *indication* and therefore curves or histograms of records are of little use and are consequently omitted and the enquiries are grouped into topics or categories.

Categories of Enquiries

	Species Concerned
Pests of the *Fabric* of homes	7
Pests attacking man's food	16
Pests of clothing and furniture	9
Pests attacking man's person	8
Pests on household animals or pets	3
Stragglers into homes	33
A total of	76 categories or species

and in addition there are 214 identifications of various sorts.

Insects attacking the **Fabric of Homes** are carpenter ants, termites, Anobiid beetles of two species, the beetle *Buprestis aurulenta* L. the longicorn *Criocephalus productus* Lec. and beetles of the genus *Lyctus*.

During 12 years out of 20, there were 55 enquiries about carpenter ants, 10 each year in 1951 and 1953 and the number is steadily increasing, reported chiefly from old houses. Of termites, there are 89 enquiries: all but one concern *Zootermopsis angusticollis* (Hagen), the one received two weeks ago is *Z nevadensis* (Hagen). Faulty construction in houses whereby the woodwork touches the earth, are responsible for most of the damage although I have four records where the colonies became established completely away from contact with the ground. Here again, the damage is increasing very heavily; in 1950 there were 12 enquiries, in 1951, 17; in 1952, 10 and so far this year 1953 there have been eleven. In many cases the damage both from black carpenter ants and from termites, has been very serious, necessitating extensive and very expensive repairs to buildings. I have a 4-ft. piece of an 8 x 10 foundation pillar from an apartment house where the inside has been completely hollowed out by termites leaving a shell, in places less than 1/8 in. thick. Anobiid or death watch beetles are also becoming of prime importance in homes. The European death watch, *Anobium punctatum* Deg., generally starts from antique furniture imported from Europe and spreads to the fabric of the house itself. I have ten records of this beetle, four in furniture alone and six in walls, but in two instances the infestation did *not* arise from heirloom furniture; the beetles apparently flew in from outside. There are 15 species of Anobiidae in the University collections, ten connected with timber of which four are on the coast and six spp. in the interior. The species that is spreading badly in Vancouver is *Coelostethus quadrulus* (Lec.) which is attracted to homes where the wood-destroying fungi *Merulius lacrymans* (Wulf.) and *Poria* spp. have produced dry rot. So far I have 23 records of infestations of *C. quadrulus* (Lec.) in Vancouver, one involving the entire house. In places where dry rot is not concerned, sapwood only is affected; heart wood is not attacked. *Buprestis aurulenta* L. originates usually in logs and the grubs that have been missed by the saws develop in the timbers, sometimes emerging as beetles from 14 to 18 years after the house was built. I have 14 records of these beetles emerging from buildings, the latest one, received this year from Port Alberni church, where many beetles emerged from floor joists, flooring and especially the pews. The church was completed fifty years ago and the pews were installed at that time. This is surely a world's record for slowness of development of any insect.

The longicorn, *Criocephalus productus* Lec., originated in fire-scorched trees, and four buildings constructed from timber from these trees, were riddled by larvae and emerging adults.

Lyctus beetles emerged from three homes where oak flooring, imported from the southern States during the war, had not been dry kilned.

Insects on **man's food** include about 20 common species; four spp. of spider beetles, the drugstore beetle, *Tribolium*, the saw-toothed grain beetle, granary and rice weevils, Mediterranean flour moth, *Plodia*, the bean weevil, cockroaches, ants, red-legged ham and larder beetles, book lice and mites on cereals and mites on cheese and dried fish. Almost all of the total of 104 records of spider beetles involve *Ptinus tectus* (Boield) (=*Ptinus ocellus* Brown) which, with 49 records of

drugstore beetles, almost always start from cans of paprika and other spices and spread to other foodstuffs. Just this year I have four definite records of *P. ocellus* occurring in carpets in considerable numbers where the grubs must have been feeding on trash deep inside the pile because they normally do not eat keratin. The drugstore beetle also is brought into houses in spice tins and packages of cereals and once did great damage to the herbarium of our university, completely destroying flowers and leaves of many pressed plants. The German cockroach is reported almost every year, as are ants in pantries. I have definitely identified Pharoah's ant only once with two more records of probably this species: the other records are of ants native to this Province. The 12 other insects in this category are of minor importance though some of them, such as the bean weevil, are sometimes very abundant when they do occur.

Insects attacking **clothing and furniture** consists of the varied carpet beetle, the black carpet beetle and the eastern buffalo carpet beetle: clothes moths, spider beetles (as recorded above), silver fish, *Perimegatoma vespulae* Mill., and *Anobium punctatum* Deg. in the wood of furniture. The varied carpet beetle, *Anthrenus verbasci* (L.), with 268 records, is easily the worst household pest in the Province. The first record in 1934 was of five larvae brought into Vancouver from an auto camp on Vancouver Island and from these five I have maintained colonies in tins every year since, but from 1938 onwards it has been sent in from this city, from most of the lower mainland, Victoria, the Okanagan and as far east as Creston and Trail. Reared in the laboratory with abundant food, there are two generations a year but usually only one in homes; in some years *two* broods per year develop in homes. In 1951 there were 74 enquiries about this pest and so far this year there have been 61; ten enquiries came in on one morning the second week in November.

The black carpet beetle was first reported from Vancouver in 1944, with 22 records up to now, nine in 1951 and four so far in 1953. It is slowly spreading in the city although it is quite common in the dry belt, as at Kamloops. The eastern buffalo carpet beetle is established at Haney and at Mission some 50 miles from Vancouver with one record from Vancouver, and it will not be long before it spreads in this city.

Twenty years ago clothes moths were the chief household pest locally but they almost completely faded out when D.D.T. came on the market, being reported only one to three times a year, but they jumped back in 1951 when seven complaints about them came in. It would appear that these two moths have developed a measure of resistance to D.D.T.

Silver fish are spreading slowly but surely, with 25 records, the highest being five in 1951. Both *Lepisma saccharina* L. and *Thermobia domestica* (Pack.) are represented. Psocids or book lice have been reported 13 times and cause annoyance and hysteria out of all proportion to their size when they flood all over a house and are very difficult to eradicate. The newest household pest is the dermestid *Perimegatoma* (or *Megatoma*) *vespulae* Milliron which is common in the dry belt at Kamloops, but has been sent in from Vancouver twice, in 1949 and 1953. For some years it was a menace to the university insect collections, having been introduced in dried insects brought down from Kamloops but it was eradicated in 1951. Last year, however, it came down from the dry belt in great bundles of pressed plants collected in the interior and developed into a serious threat, eating the flowers of dried plants, especially those of *Ranunculaceae*. This summer the herbarium collections had to be fumigated against it.

On **human beings,** 10 species occur—the human flea, cat and dog fleas, ticks, itch mites, bedbugs, body and crab lice and rat and poultry mites. The *human flea* has been reported in nine out of 20 years with not more than two reports of it in any one year. But in several parts of eastern Vancouver

Island, chiefly Qualicum and Sydney, It sometimes develops in tremendous numbers on sea beaches. There are 119 reports of cat and dog fleas, of which 44 occurred in the year 1940, when people became conscious of it after a broadcast on fleas. One or other of the two species (or both) has been reported for 17 years out of 20. This climate is well suited to these insects which sometimes develop to plague proportions in a house. There have been 19 records of bedbugs with no reports at all from 1947 to 1950; only five since then: it is possible that these insects also are becoming resistant to D.D.T. Body lice are unusual with only two records; but one, in 1946 was outstanding because the almost unbelievable hordes of these insects were a contributing factor to the death of an old man living alone in a cabin. Both rat mites and poultry mites on pigeons, developing in the nests of these animals, sometimes swarm out and spread over buildings; such invasions have been reported six times.

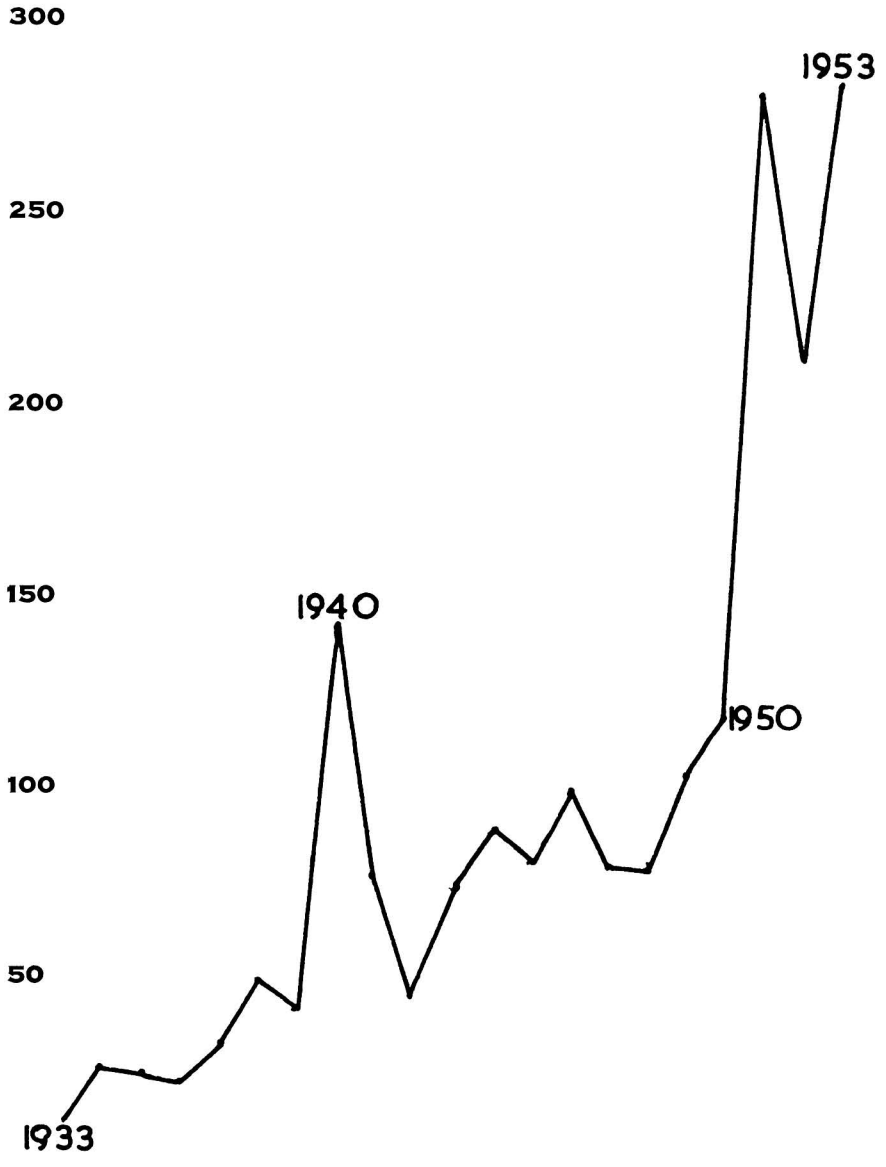
There are 34 records of ticks, almost all of the coast tick with one only (1953) of the Rocky Mountain spotted fever tick, *Dermacentor andersoni* Stiles (*venustus* Marx), attaching to a woman on Fraser Avenue in Vancouver when she was out of the house for ten minutes. Nobody in the house and no neighbours had recently been upcountry and the origin of this dry belt tick in Vancouver, cannot be explained.

On house pests, ear mites of dogs and cats are common; mange mites and puppy lice and mites on birds are occasionally reported. Fleas on cats and dogs are, of course, of perennial occurrence.

The list of **stragglers into homes** is large, with complaints of spiders and ants heading the list. Spiders have been reported for 17 years and ants for eleven years, the invasions of ants generally occurring in new houses, when their homes having been disrupted the insects wander in all directions for some days and straggle into buildings. House flies are so taken for granted that there were only 11 complaints about them, five in 1939, one in 1950, two in 1952, and three in 1953. There are two definite reports of resistance to D.D.T. in houseflies in 1953, one from a packing house in this city where the management spent $1,000 in vain last year, and the other from the sanitarium at Tranquille near Kamloops. This autumn I received details of myiasis by the lesser house fly, *Fannia canicularis* Linn., when a large number of larvae was discharged from the urinary passages of a five-year old girl. In 1952 one record from North Vancouver concerned two successive broods of the house fly, *Musca domestica* L., developing in the mattress of a baby's crib: the resulting adults were only half normal size.

Other *invaders* of homes are constantly reported but are of very minor importance, several species of Diptera, including *Drosophila,* mosquitoes and black flies; sowbugs, earwigs, wasps and wasps' nests, mud wasp nests, pseudoscorpions, *Bryobia* mites, caterpillars and moths, European house crickets and native black crickets, *Tropidischia xanthostoma* Scudder, the giant cave cricket and smaller camel crickets; bedbugs from bats and swallows, great flights of ladybird beetles in the autumn (*Hippodamia ambigua* Lec.), the black vine and strawberry weevils, Collembola, and carabid beetles seeking shelter for the winter in basements.

Some stragglers or invaders merit attention. I have 25 records of Case bearer larvae appearing for eight years since 1944, in large numbers, migrating from trees near houses. I have fed these larvae on scale insects on willow and find them actively carnivorous, cleaning out sheets of scale and even eating the wax of scales, but have never succeeded in rearing the moths. Millipedes have 24 times invaded houses in huge numbers, migrating from woods alongside of newly erected houses. In the four years 1938, 1944, 1945 and in 1952, parts of the city were invaded by *Nomius pygmaeus* (Dej.), the stink beetle,



ANNUAL TOTALS OF ENQUIRIES 1933-1953

which rendered homes untenable for days until I found out that chlorine will neutralize their appalling odour.

A distinct phase of invaders are those that come into homes with firewood—some breeding in the wood, like Nitidulidae; bark beetles, like *Pseudohylesinus:* wood eaters as *Ergates spiculatus* Lec., buprestid larvae and Bostrichidae; carabid beetles, and sow bugs. The borings or tunnels of the shipworm teredo, *Bankia* sometimes cause alarm when they are apparent in firewood.

Not insects, but *rats*, have been reported 27 times; citizens apparently class them with insects, as household vermin.

Finally, I must comment on the attitude of people since 1945, towards insects in general. The whole attitude of citizens has changed; they have become *too* insect conscious and demand relief by the use of chemicals, from innocuous, inconsequential and even useful insects. Hysteria caused by the presence of insects, is increasing: I have now 16 case histories of "insectophobia" varying from unwarranted loathing, to hysteria, to mental unbalance necessitating long periods in mental hospitals. If taken early, these cases can be cured by commonsense appeal and reasoning, but the more severe ones are tragic and pitiable, necessitating phychiatric treatment and hospitalization. Much of this hysteria can be laid to awareness of modern insecticides which is inducing people to want to get rid of ALL insects, everywhere.

SCIENCE NOTE

Notes on the Occurrence of the Painted Lady, *Vanessa cardui L.* on Vancouver and the Queen Charlotte Islands in 1952.

This cosmopolitan species, well known for its unpredictable abundance or scarcity from one year to another, has been common on Vancouver Island during the season of 1952. Worn specimens were noted early in the spring, evidently having hibernated elsewhere than on the island for the species was not noticed by me during the fall of 1951. These battered and faded individuals were observed continually until near the end of August, when freshly emerged specimens began to appear and remained abundant until well into October. They were very partial to the flowers of thistles, and in gardens, buddlia, scabiosa, asters, dahlias, etc. Individuals of this species were seen everywhere from Island View Beach on the coast to the summit of Mount Arrowsmith and all places in between. Philip Dover of Sandspit, Queen Charlotte Islands, wrote to me stating that to his knowledge he has seen them this year for the first time. They were never seen in as large numbers as reported from time to time in other countries, but occurred here in ones and twos, up to a dozen or two at any one time, throughout the season, and at almost every hour of daylight in suitable weather. From late August to October larvae were frequently found in their little tents on thistles; almost every patch had its quota. All these pupated and emerged in the period August to October of this year. The parasite *Ichneumon rufiventris* Brulle was reared from one pupa. This was named by W. R. Mason at Ottawa.

Up to July 1953 no painted ladies have been seen, although numerous examples of other hibernating species have been noted during February and March.

Have the large number of *cardui* seen late in the fall all died during hibernation or did they migrate elsewhere before finally seeking winter quarters; or did they just die, without hibernating or migrating? So far there is no evidence to show what happened.—*G. A. Hardy.*