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THE LAND AND FRESHWATER SHELLS OF ALBERTA.

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Very little has been published up to the present time on the Mollusca of the District of Alberta.

The first naturalist to pay any attention to the subject was, I believe, Dr. G. M. Dawson, who, 20 years ago (1873-74), was acting as naturalist to the British North American Boundary Commission, and who published (in 1875) as an appendix to his report, a list of the land and freshwater shells that he had obtained during the progress of the boundary expedition.

Though most of his shells were collected in the neighbourhood of the Lake of the Woods and in other places in Manitoba and Assiniboia, Dr. Dawson obtained a few species in Alberta, the most notable being a fine variety of *Patula strigosa* which was found near Waterton Lake at the base of the Rocky Mountains and just within the boundaries of the district. At the time this shell was thought to be an undescribed species and was named by Dr. Dawson *Helix limitaris*.

Since the date of Dr. Dawson's explorations Alberta has on several occasions been visited by members of the staff of the Geological Survey and I have seen in the Museum at Ottawa some interesting species collected by them ; but as no record of these shells appears to have been published, and I am ignorant of the precise localities whence they came, I do not like to include them in the present list.

Three years ago Mr. T. E. Bean, the well known lepidopterist of Laggan (which place is close to the Western boundary of Alberta) began to investigate the shells of his neighbourhood and very kindly gave me specimens of all the species he observed. In the autumn of 1893 I had the pleasure of spending two days at Laggan in Mr. Bean's

company and was successful in finding several species that had escape his notice.

The result of our joint collections was published in the "Nautilus" for December 1893 (Vol. VII. p. 85.) Nineteen species (14 land and 5 freshwater) are enumerated in that paper and two other land shells should also have been included viz. *Pupa simplex* and *Vertigo ovata* of both of which species Mr. Bean had taken specimens.

During the past three summers (1892-3-4) Mr, A. O. Wheeler. D.L.S. (now of the Canadian Topographical Survey, Ottawa) has been surveying in different parts of the district. While in the field he has always, most kindly, kept a sharp lookout for shells, and at the close of each season has very liberally sent his collections to me. As a result chiefly of Mr. Wheeler's industry and success as a collector I am now able to present a list of 44 species of land and freshwater shells inhabiting this little known part of the Dominion.

The first of Mr. Wheeler's collections was made in the summer of 1892. Shells were obtained in the Battle River at a point where the Calgary and Edmonton trail touches the river, about 60 miles south of the last named town. From this locality came five (5) specimens of *Anodonta lacustris*, two of *Margaritana complanata*, one of *Unio luteolus* and two of the large heavy form which in Canada goes by the name of *Unio subovatus*; also, three valves of *Pisidium abditum* and a single valve of a *Sphaerium* which Mr. E. W. Roper has pronounced to be probably *S. fabale*.

A few shells were also collected in a creek and a slough both near Egg Lake, twelve miles south of Victoria (a Hudson Bay Post) on the Saskatchewan River. In the creek were obtained *Planorbis trivolvis* and *Limnæa stagnalis*; and in the dried up slough *Segmentina armigera* (one specimen,) *Limnæa palustris, Sphaeriuu solidulum* (four valves only) and twelve specimens of a *Succinea* which I think must be *S. Grosvenori*.

Mr. Wheeler's next collection was a much larger one made in 1893 while he was surveying 30 or 35 miles east of Red Deer on the Calgary and Edmonton Railway. Among the land shells, which were mostly collected in dried-up sloughs, were numerous specimens of

the widely distributed *Vitrina limpida*, *Hyalina arborea*, *Hyalina radiatula*, *Conulus fulvus*, *Patula striatella*, *Vallonia costata* (form *gracilicosta*) and *Ferussacia subcylindrica*. Besides these there are specimens of three species of *Pupa*, namely *P. armifera* (19 specimens,) *P. Blandi*,(4),and *P. Holzingeri*,(2) all collected from drift by the Red Deer River. Lastly, there were specimens of 3 species of *Succinea* which, throughout this paper I have called *S. avara*, *S. ovalis* and *S. Grosvenori*. I must say however that though using these names I am of opinion that the first two are applied to shells specifically distinct from the eastern shells that are so called.

Of freshwater shells Mr. Wheeler collected 13 species; the ubiquitous *Limnæa palustris* and *L. stagnalis*, *Planorbis trivolvis* and *Physa heterostropha*, *Bulimus hypnorum* and *Pisidium abditum*; also the less abundant *Limnæa desidiosa L. caperata* and *L. reflexa*, *Segmentina armigera*, *Valvata tricarinata* (Red Deer River) and lastly a number of specimens of *Planorbis nautileus var. cristatus*, which I begin to think must be indigenous to North America. These last named shells were found in moss from the bed of a muskeg in township 39, range 23, W. of 4th. meridian. Specimens of *L. reflexa* in this collection are the largest I have ever seen, attaining a length of 42 mm.

The latest of Mr. Wheeler's collections was received in January last and contains the shells collected by him during the summer of 1894 in Southern Alberta in the neighbourhood of MacLeod and the Little Bow River.

There are not so many species in this as in the former collections but among them are three notable additions to our list, *Planorbis umbilicatellus* (2 specimens), *Limnæa bulimoides* and *Sphærium Jayanum*. The first named appears to be quite distinct from *P. parvus* with which, judging merely from the original description and figure, I was formely inclined to unite it. This interesting shell was described as *Planorbis umbilicatus* by Mr. J. W. Taylor in the English "Quarterly Journal of Conchology" Vol. iv, p. 451 (July 1884), from specimens collected by Mr. R. M. Christy, near Brandon, Birtle and Rapid City in Manitoba. The name being pre-occupied it was changed to *umbilicatellus* by Mr. T.D.E. Cockerell in the "Conchologists' Exchange"

November 1887, p. 68. The species was not again noticed, I think, until Mr. Homer Squyer quite lately found a single specimen in river drift near Mingusville, Montana as recorded by him in the "Nautilus" for October 1894 (Vol. viii. p. 95.)

The second addition to our list from this collection is a small *Limnæa* which is probably the *Limnæa bulimoides* of Lea. Though allied to, and in this instance collected with, *Limnæa palustris* it seems quite distinct from all forms, that I have seen, of that very variable species. The largest of the 28 specimens collected is only 8 x 5 mm. but is quite mature and has a thickened red-edged outer lip and also a second red line, marking a former stage of growth, about 1½ mm. within the aperture.

The third addition is *Sphærium fayanum* and the shells I refer to this species are from Crow Lodge Creek, Mosquito Creek and Little Bow River.

The other shells contained in this collection are *Conulus fulvus Patula striatella, Succinea avara, Pisidium abditum, Limnæa palustris, L. stagnalis, L. caperata, L. desidiosa, Planorbis trivolvis, P. parvus; Physa heterostropha* and *Bulimus hypnorum*, all common and widely distributed species.

It will be seen that Mr. Wheeler's collections have added twenty two species to the twenty one already known from Laggan and if we add also Dr. Dawson's *Patula strigosa* we shall have 44 as the grand total of the land and freshwater Mollusca of Alberta as at present known.

No doubt this list will some day be considerably extended and an examination of the list of Montana shells lately published in the "Nautilus" by Mr. Squyer and the other Manitoba and Assiniboia lists of Dr. Dawson, Dr. Bell, and Mr. R. Miller Christy, will give us a good idea of the species that may be expected to occur also in Alberta.

In the list that follows the three collections of Mr. Wheeler, the Laggan shells of Mr. Bean and myself, and a small collection received a few days ago from Mr. T.N. Willing of Olds, Alberta, through the kindness of Mr. James Fletcher, are tabulated, *Patula strigosa*, as

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LIST OF THE LAND AND FRESHWATER SHELLS OF THE DISTRICT OF ALBERTA.

LAND SHELLS	Bean & Taylor	Wheeler, 1892	Wheeler, 1893	Wheeler, 1894	Willing, 1895	Remarks.
1 Limax hyperboreus, West	x					
2 Vitrina limpida, Gould	x		x			
3 Hyalina arborea, Say sp	x		x		x	
4 Hyalina radiatula, Alder, sp.	x		x			
5 Conulus fulvus, Drap. sp	x		x	x		
6 Patula strigosa, Gould sp.						Waterton Lake
7 Patula striatella, Anthony sp.	x		x	x	x	
8 Vallonia pulchella, Mueller sp. *form* gracilicosta, Reinh	x		x			
9 Pupa Hoppii, Mueller	x					
10 Pupa Blandi, Morse,			x			
11 Pupa armifera, Say			x			
12 Pupa Holzingeri, Sterk.			x			
13 Pupa pentodon, Say sp	x					
14 Pupa simplex, Gould	x					
15 Pupa alticola, Ingersoll	x					
16 Vertigo ovata, Say	x					
17 Vertigo ventricosa, Morse	v					
18 Ferussacia subcylindrica, Linn, sp.	x		x			
19 Succinea avara, Say	x		x	x	x	
20 Succinea ovalis, Gould	x		x			
21 Succinea Grosvenori, Lea		x	x			
FRESHWATER SHELLS.						
22 Valvata sincera, Say	x					
23 Valvata tricarinata, Say			x			
24 Limnæa stagnalis, Linn, sp.		x	x	x		
25 Limnæa reflexa, Say			x			
26 Limnæa palustris, Mueller, sp.	x	x	x	x	x	
27 Limnæa bulimoides Lea				x	x	
28 Limnæa desidiosa, Say			x	x		
29 Limnæa caperata, Say			x	x		
30 Physa heterostropha Say			x	x	x	

FRESHWATER SHELLS.	Bean & Taylor.	Wheeler, 1892.	Wheeler, 1893	Wheeler, 1894	Wheeler, 1895	Remarks.
31 Bulimus hypnorum, Linn, sp.			x	x	x	
32 Planorbis trivolvis, Say	x	x	x	x	x	
33 Planorbis parvus, Say	x		x	x	x	
34 Planorbis umbilicatellus, Cockerell.				x		
35 Planorbis nautileus, Linn, var cristatus			x			
36 Segmentina armigera, Say, sp.		x	x			
37 Sphærium solidulum, Prime		x				
38 Sphærium fabale, Prime		x				
39 Sphærium Jayanum, Prime				x	x	
40 Pisidium abditum, Haldeman	x	x	x	x	x	
41 Unio luteolus, Lam.		x				
42 Unio subovatus, Lea		x				
43 Magaritana complanata Barnes		x				
44 Anodonta lacustris, Lea		x				

REPORT OF THE ENTOMOLOGICAL BRANCH, 1894.

Read, February 12th, 1895.

To the Council of the Ottawa Field-Naturalists' Club:

It is with pleasure that the Leaders report to the Club the prosperous state of this branch. A great deal of good work has been done during the past year, not only in collecting specimens in the various orders of insects, but also in working up material accumulated in previous years. In this way many names have been added to the lists of insects recorded as having been found in the district. A few of the more interesting finds have been recorded in the *Ottawa Naturalist*, and the others have all been recorded for publication in the lists, from time to time, as these are thought sufficiently complete. During the year, two supplementary lists of local Hemiptera have been published by Mr. Harrington. In addition to the work done by the leaders individually, the opportunities of interesting members of the Club at the excursions were taken advantage of with the good result

Wheeler, 1893	Wheeler, 1894	Wheeler, 1895	Remarks.
x	x	x	
x	x	x	
x	x	x	
	x		
x			
x			
	x	x	
x	x	x	

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that some good species were secured by members not specially interested in Entomology.

At the first excursion in the spring, we were pleased to welcome Dr. Scudder, of Cambridge, Mass., the eminent American entomologist, and also our fellow-member, Dr. Bethune, of Port Hope, the editor of the *Canadian Entomologist*, and well known for many years as an active Canadian naturalist. Dr. A. H. Mackay, and Prof. J. Fowler, of Kingston, experienced botanists, were also with us, and helped to make a most successful and enjoyable excursion, particularly for the entomologists and botanists.

Some of our members made interesting collections in the west; notably Prof. Macoun, at Crane Lake, and Messrs Klotz and Simpson, in Alaska.

LEPIDOPTERA

On the whole the past season cannot be said to have been a very good one for insects, although, as is always the case, careful search and constant watchfulness added several desirable species to our cabinets. Some good work has been done in working out the life histories of some of the native butterflies and moths, a most fascinating study, and an excellent means of securing good specimens for the cabinet. The following species have been partially or completely reared from the egg:—*Papilio Bairdii*, (=*Oregonia,*) *Colias Elis*, *Colias Nastes*, *Chionobas Jutta*, *C. Macounii*. The first from eggs sent from Colorado, by Mr. W.H.Edwards, and all but the last, from eggs collected at Laggan, in the Rocky Mountains by Mr. T. E. Bean. From eggs obtained at Ottawa: *Chrysophanus Thoë*, *Colias Eurytheme*, *C. Philodice*, *Pamphila Metacomet*, *P. Cernes*, and *P. Mystic* have been reared.

COLEOPTERA.

Considerable additions have been made to the Ottawa lists of beetles, but some of the species are yet unidentified. Among those determined may be mentioned *Oestodes tenuicollis* and *Conotrachelus anaglypticus*. Three specimens of the rare *Stapylinus erythropterus*, only once previously recorded in America, were taken in Dow's Swamp