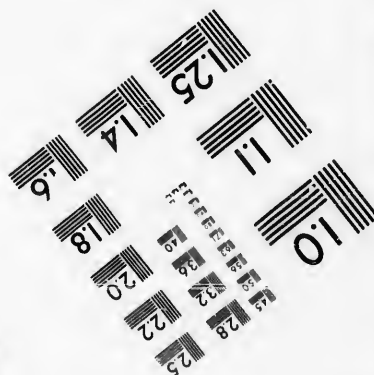
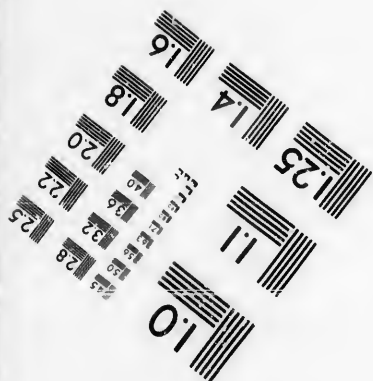
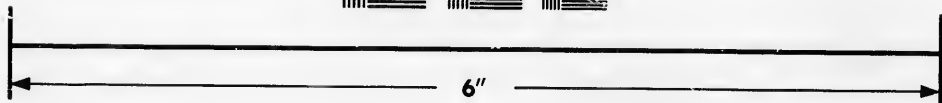
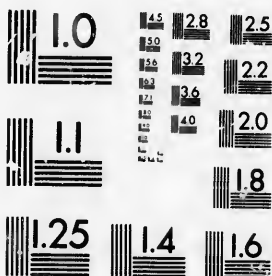


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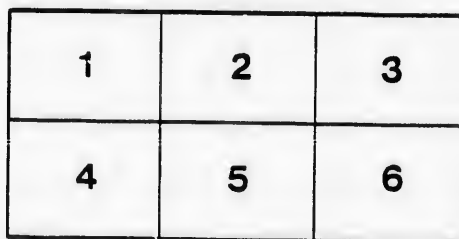
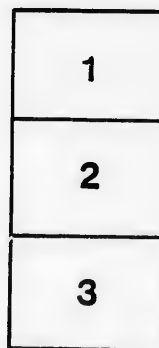
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The Montreal Nat. Hist. Society, with
the author's Compl. Aug. 22nd 1885.

NOTES ON THE
LAND & FRESHWATER MOLLUSCA OF MANITOBA.

BY ROBERT MILLER CHRISTY.

[Reprinted from the *Journal of Conchology*].

CHRISTY, ROBERT MILLER, 1861-
Notes on the land...

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NOTES ON THE
LAND & FRESHWATER MOLLUSCA OF MANITOBA.

BY ROBERT MILLER CHRISTY.

Although Manitoba is a country which has of late occasioned much talk and discussion, it is but comparatively a few years since it was the undisputed home of the Indian, the Buffalo, and the Hudson's Bay Company. What little was then known as to its great agricultural capabilities and its natural products had principally been collected by survey-parties sent out for the purpose of selecting the best route across the continent for the Canadian Pacific Railway, consequently it is but slight wonder that very little should be known concerning so comparatively unimportant a branch of natural history as the mollusca.

Having found occasion to visit Manitoba several times during the last two years, and having always endeavoured to obtain as large a series as possible of its mollusca, it is now my intention to make a few remarks upon the results of my collecting; and in so doing it is impossible for me to acknowledge too fully my great indebtedness to Mr. J. W. Taylor who has been most kind in identifying all my specimens. So little having hitherto been published upon the subject, I have thought it well to make my notes as complete as possible by incorporating with them some additional information gained from two other sources. One of these is a collection of the shells of Manitoba and the region around the Lake of the Woods formed by Dr. G. M. Dawson of the Geological Survey of Canada, and now exhibited in the Peter Redpath Museum at Montreal; the other source consists of two lists of shells collected in the country between Winnipeg and York Factory, by Dr. Robert Bell, also of the Survey, identified by Mr. J. F. Whiteaves, and published in the Annual Reports.*

* App. III. (pp. 61 and 62) to Mr. Bell's Report of 1878-79; also App. IV. (pp. 75 and 76) to Mr. Bell's Report of 1879-80.

The contributions of these gentlemen are indicated by having their respective names attached.

Those who entertain the usual English idea that the Manitoban winter is an altogether unbearable one, of purely Arctic inclemency, may at first be surprised to learn that the country possesses a molluscan fauna at all ; still more that I am able to enumerate 72 species. Nor is this idea altogether unreasonable, for it certainly is somewhat surprising that so many species should be able to exist in a country where the temperature has been known to be as low as -50.5° Fahr. At the same time it should be remembered that the Manitoban summer is a delightful time.

The one great fact which must strike all observers of the molluscan fauna of Manitoba is the absence from the bare, open face of the prairies of every single species of land mollusk whatsoever. This absence, so far as my experience goes, is total and complete. On the other hand, the abundance of aquatic species is extraordinary. Nearly every one of the innumerable lakes and lakelets, so abundantly scattered over the prairies, contains a surprising number of shells belonging to several species. When the water has disappeared after a period of drought, they may often be scraped up by the handful at a time. Prof. Hind, in his "Narrative of the Assiniboine, Red River, and Saskatchewan Exploring Expeditions of 1857-58,"* says of the southern end of Lake Winnipeg: "The beach and marshes contain an infinite number of freshwater shells, belonging to the genera *Heix*, *Bulimus*, *Succinea*, *Pupa*, *Planorbis*, *Limneus*, &c. For many hundred yards the beach is covered with perfect or disintegrated forms of these shells thrown up by the waves on the sand." This statement serves well to show the enormous abundance of shells in, the Manitoban lakes ; but as only two of the genera mentioned inhabit the water, one cannot help thinking that their identification must be wrong.

* Vol. II., p. 8.

Of the 72 species which I am able to record, only 16 inhabit the land, and even they are only found in moist situations where the fire seldom penetrates. This great dearth of terrestrial species might, on first thoughts, very naturally be attributed to the excessive frosts, but I believe I am able to assign to it a much more direct cause, viz., Fire. If it were attributable to cold, how is it that thousands of individuals are able to exist in shallow ponds that must certainly become frozen solid during winter? I have elsewhere entered fully into the subject of the effect produced on the face of the country by the extensive prairie-fires that have annually swept over it for generations past.* There are good reasons for believing that the very prairies themselves, their treelessness, and their fertility are all due, to a large extent, if not entirely, to the action of these fires. I have further stated my belief† that the complete absence of earth-worms of every kind from the surface of the prairies is, in all probability, due to the same cause; and I see no reason to suppose that the remarkable absence of land shells is due to any other. The fire annually burns the grass over which it passes, completely down to the ground, and I have had many occasions of observing that this would effectually kill any mollusks that were harbouring among its roots. On the drier portions of the prairies, settlers often cut their hay round the margins of small depressions in which water collects, and shells—especially *Limnæidæ*—live during the spring. This done, they set fire to the remaining grass-stalks in order, as they say, that the grass may come up greener and more succulent the following spring. Under such conditions I have often seen the shells lying on the dry pond-bottom completely scorched and calcined by the flames. It seems to me, therefore, in every way probable that these prairie fires are the cause of this absence of terrestrial mollusks from the face of the country, especially

* 'Manitoba Described,' p. 20. Wyman & Sons, Great Queen Street, W.C. 1885.

† 'Nature,' Jan. 3, 1884, p. 213.

as aquatic species, in astonishing abundance, are found in all the ponds, lakes, sleughs, and streams.

Most of my collecting was done in the vicinity of the town of Carberry, which is surrounded by a dry, level prairie, known as the Big Plain. Others of my specimens I obtained from the many moist spots or ponds occupying the hollows of the rolling prairie around the City of Brandon; others from the innumerable ponds and lakes everywhere dotting the country between Brandon and Fort Ellice; others from depressions in the level sandy prairie south of Beaver Creek, near Fort Ellice; while others are from the Red River, the Souris, and the Assiniboine. One great feature of the prairie-region, of which Manitoba forms part, is the extraordinary number of lakes and lakelets. Their number is enormous, especially in some localities. They are of all sizes from the dimensions of one's sitting-room up to the size of Lake Winnipeg; but the most common size is from one-quarter to half-an-acre. The smaller ones dry up completely during the summer and autumn; while the water in the larger ones becomes greatly lowered, to be raised again by the melting of the snow in the spring. Myriads of mollusks must come into existence every spring, only to be killed by the drying up of the ponds later in the year. To such an extent is this the case that one is almost led to wonder that their extermination does not ensue. When crossing, last October, the wide stretch of level sandy prairie south of Beaver Creek, I was surprised to find the ground strewn for long distances—often a mile or a mile and a half—with bleaching fresh-water shells, showing clearly the extent of the waters in the spring-time, though I saw but few pools. *Limnæa palustris* was the commonest species under these conditions; but, in the deeper depressions, where rushes grew, there were others, including *Bulinus hypnorum*, *Sphaerium jayanum*, *Planorbis exacutus*, &c. A sleugh is a marshy spot or pool on the surface of the prairie, often occupying the bottom of a coulée or old watercourse. "The Swamp," more than once referred to, is a large extent of almost impassable virgin swamp,

covering several square miles in area, and lying among the sand-hills about eight miles south of Carberry. In most places it is covered with a dense growth of spruces and tamaracs, under the shade of which the Indian Pitcher plant (*Sarracenia purpurea*) often covers acres of the sodden, mossy ground, which quakes as one walks over its treacherous surface. The giant Lady's Slipper (*Cypripedium purpureum*), several of the Sundews (*Drosera*), and many other interesting plants inhabit the same locality. There are, in Manitoba, several Pine Creeks, but the one so often referred to is a rather small river which flows through the heart of the great swamp just referred to, winding its way dreamily to the Assiniboine through many muddy channels, clogged by the leaves of the water-lily, and fringed with a thick growth of willows and bulrushes. I never felt so utterly beyond the range of civilization as when a friend and myself found ourselves (in the course of our travels) miles from any other human beings, on the edge of this lonely, but beautiful, stream, across which we found it necessary to swim, carrying all our effects. Looking down from the shaking bank into the clear, dark water (which I afterwards learned, from personal experience, was highly poisonous), I could see many little collections of dead shells lying at the bottom. Placing a stick in the spout of our camp-kettle, I made a dive, and a single scoop with this primitive dredge brought up more than a dozen different species. That some, at least, of the rivers abound with shells, is shown by the fact that several in the North-west Territories have received the distinctive name of "Shell River." I have seen the bed and sides of the principal of these, which runs into the Assiniboine from the east about fifty miles above its junction with the Qu'appelle, strewn with hundreds of dead shells belonging to many different species of Unionidæ; but, as I had no means of bringing any away, they are not again referred to herein.

- Unio rectus** Lam.—Red River at Winnipeg. Do. (Bell).
- U. radiata** Lam.—Numerous in Lake Winnipeg and the Nelson River (Bell).
- U. luteolus** Lam. (= *Hyridella luteola* Lam. = *U. siliquoides* Barnes).—Common in the Red River at Winnipeg, and in the Assiniboine at Brandon. Red River (Bell).
- U. rubiginosus** Lea (= *Lampsilis flavus* Rafinesque).—Junction of Souris and Assiniboine. Red River (Bell).
- U. plicatus** Le Sueur.—Red River at Winnipeg. (Do. Bell).
- U. asperimus** Lea. Do. do.
- U. undulatus** Barnes. Do. do.
- U. ————** ? Do. do.
- U. ————** ? Do. do. Assiniboine at Brandon.
- U. ————** ? Assiniboine at Brandon.
- U. ————** ? Do. do.
- U. ————** ? Red River at Winnipeg.
- U. lachrymosus** Lea (= *Theliderma quadrulus* Raf.).—Red River, Manitoba (Bell).
- U. multiplicatus** Lea.—Red River. Common (Wm. Brodie, Esq., of Toronto).
- U. borealis** Gray.—Near the Lake of the Woods (W. Brodie, Esq.).
- Metaptera alatus** Say. Do. do.
- Complanaria complanata** Barnes.—“Common in the Nelson River, but larger in the Red and Assiboine Rivers” (Bell).
- Strophitus pennsylvanicus** Lam. (= *Anodonta undulata* Say).—Lake Winnipeg, Great Play Green Lake (Bell).
- Anodonta** ? sp.—Red River at Winnipeg (Bell).
- Pisidium variabile** Prime.—Common in Pine Creek.
- Sphærium sulcatum** Lam.—Stony Creek, near Fort Pelly, a tributary of the Assiniboine; Pine Creek. Probably common in creeks.
- S. rhomboideum** Say.—Common in Pine Creek.


- S. striatinum** Say.—Several from Pine Creek. Ponds at York Factory; also in abundance in the stomach of a sturgeon caught in the Great Play Green Lake (Bell).
- S. transversum** Say.—Numbers in the stomach of the same sturgeon. (Bell).
- S. jayanum** ? Prime.—Abundant among roots of rushes on wetter parts of the shell-covered prairie south of Fort Ellice, but not observed elsewhere.
- S. solidulum** Prime.—Bleached and semi-fossil specimens were abundant in the denuded banks of the Red River at Winnipeg and the Assiniboine at Brandon.
- Vitrina limpida** Gould.—Among moss beside a slough near Carberry, but not seen elsewhere. Near Reed River; the Lake of the Woods (Dawson). In damp Woods at Norway House (Bell).
- Hyalina arborea** Say.—Moist spot beside slough near Carberry; under chips and pieces of wood in the Swamp. Round Lake of the Woods (Dawson).
- H. viridula** Menke (= *Zonites radiatulus* Ald.).—Dry pond-hole on prairie near Brandon; common among roots of grass beside slough near Carberry. Lake of the Woods; Pembina Mountain (Dawson).
- H. indentata** Say.—One specimen of the variety with open umbilicus from Pine Creek.
- H. fulva** Drap.—Pretty common in moist spots beside sloughs near Carberry; also in the Swamp; Pine Creek. Lake of the Woods; Pembina Mountain (Dawson).
- Helix striatella** Anth.—Beneath chips and pieces of wood and among moss in the Swamp. Turtle Mountain; Lake of the Woods (Dawson). "In Woods round the Lakes of the Winnipeg Basin" (Bell).
- H. labyrinthica** Say.—Edge of slough near Carberry; and in the Swamp.
- H. pulchella** Müll.—Pembina Mountain (Dawson).

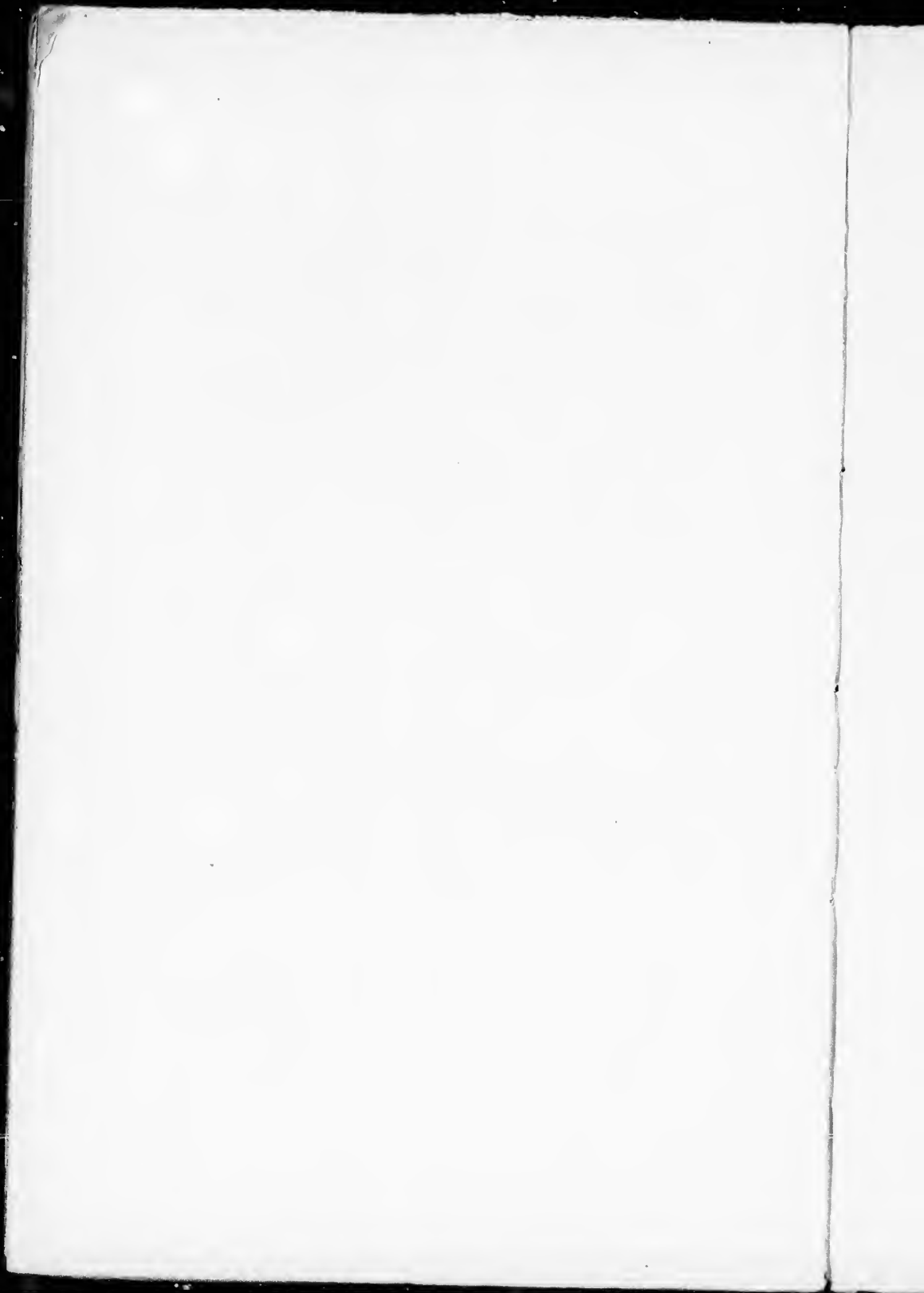
- Cionella sub-cylindrica** Linn. (= *Cochlicopa lubrica* Müll.)—Among moss and grass-roots in moist spots beside sleughs near Carberry, but not common. Turtle Mountain ; Lake of the Woods (Dawson).
- Pupa contracta** Say.—One specimen (the only representative of the genus seen) from among grass-roots beside a sleugh near Carberry.
- Succinea haydeni** Binney.—Pembina Mountain (Dawson).
- S. ovalis** Gould.—Lake at High-bluff ; quite common on wet moss and weeds beside lakes and sleughs near Carberry and Brandon. Lake of the Woods (Dawson). “From Norway House to York Factory ; very numerous at the latter place among grass on damp ground which is occasionally covered with fresh-water at high tide” (Bell).
- S. avara** Say.—Edge of a lake at High-bluff ; many bleached specimens were strewn over the dry alkaline surface of a large shallow pond-hole at Two Creeks, about twenty miles north of Virden. Lake of the Woods (Dawson).
- S. obliqua** Say.—Lake of the Woods ; Dufferin (Dawson).
- S. hawkinsii** Baird (= *S. elegans* Risso.)—Fairly common on edges of lakes round Carberry, Birtle, &c.
- Carychium exiguum** Say.—Edge of sleughs near Carberry ; Pine Creek ; dry pond-hole near Brandon. Apparently well distributed.
- Limnæa stagnalis** Linn.—Very common, though it does not appear in all lakes. The specimens are sometimes very fine, and, as a rule, all those in any one lake appear to be of about the same size. I have fine specimens from lakes near Birtle, Rapid City, and Carberry ; also smaller ones from Cook's Lake, near Shoal Lake, &c. “In nearly all the lakes, streams, and marshes from Manitoba to York Factory” (Bell).
- L. megasoma** Say.—“This fine species was found living in considerable numbers in the Echimamish River, between the Nelson and the Height of Land. Its discovery at this

place is interesting on account of its great distance to the Northward of previously-known localities for the species." (Bell).

- L. palustris** Müll. (= *L. elodes* Say).—This is by far the commonest shell in Manitoba. It is abundant in nearly all lakes, ponds, and sleughs all over Manitoba wherever I have been. It is exceedingly variable and possibly includes several allied species, but neither Mr. Taylor nor myself are able to distinguish them. I obtained a semi-scalariform monstrosity from a lake near Carberry. "Numerous and fine in ponds at York Factory; also abundant in ponds along the Red River in Manitoba." (Bell).
- L. elodes** Say.—Lake of the Woods; Dufferin; Pembina, and Turtle Mountains (Dawson).
- L. elodes** var. *umbrosa*.—Sleugh near Beaver Creek.
- L. elodes** var. ——— ?—A very small form, not exceeding three-eighths of an inch in length. Abundant in a dry sleugh near Brandon.
- L. desidosa** ? Say.—Dry pond-hole near Brandon.
- L. catascopium** Say.—Dufferin (Dawson). Great Play Green Lake; common in different parts of Oxford Lake (Bell).
- L. caperata** Say.—Pine Creek; Lake near Rapid City. Pembina Mountain (Dawson).
- L. cygruata** Say.—Dufferin (Dawson).
- L. decollata** Migel.—Lake of the Woods (Dawson).
- L. humilis** Say.—Dry pond-hole near Brandon. Pembina Mountain (Dawson).
- Physa ancillaria** Say.—Lake of the Woods (Dawson).
- P. heterostropha** Say.—Appears to be widely distributed, but is not common. I got fine specimens from Two Creeks and from a lake at High-bluff, while smaller ones came from lakes near Brandon, Birtle, Rapid City, and Carberry. Lake of the Woods (Dawson).

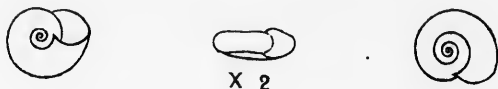
- P. gyrina** ? Say.—“ Small specimens of a *Physa* resembling the *P. elliptica* of Lea [= *P. gyrina* Say ?], but possibly distinct herefrom, were found in ponds at York Factory ” (Bell).
- Bulinus hypnorum** Linn.—A very common shell in lakes and sloughs. Carberry, Brandon, Fort Ellice, Birtle, &c., &c. Pembina Mountain, &c. (Dawson). “ This species occurs in ponds all the way from Manitoba to York Factory ” (Bell).
- Planorbis trivolvis** Say.—A fairly abundant and well distributed species. I found it in most lakes, but not in all, throughout the country. Lake of the Woods ; Dufferin, &c. (Dawson). “ Some very large specimens of this were collected in the Echimamish River on the west side of the Height of Land. Although common in ponds, rivers, and marshes to the south and west, it was not observed to the northward of this locality ” (Bell).
- P. bicarinatus** Say.—“ A peculiar variety of this species occurs in Lake Manitoba ” ; Lake Winnipeg (Bell).
- P. complanatus** Say.—“ Abundant in Lake Winnipeg and in the Red and Nelson Rivers ” (Bell).
- P. corpulentus** Say.—Lake of the Woods (Dawson).
- P. exacutus** Say.—Common in many of the lakes and ponds between Birtle and Rapid City, but not in all ; ponds near Beaver Creek ; Pine Creek. Not seen near Carberry or Brandon.
- P. parvus** Say.—Exactly the same as the last species.
- P. umbilicatus** Taylor, n. sp.—Found in ponds between Rapid City and Birtle ; also near Brandon.
- Segmentina armigera** Say.—A few from Pine Creek ; common in some lakes and sloughs near Birtle, Fort Ellice, Two Creeks, &c., but not in all ; abundant in a lake at High-bluff ; not seen near Carberry or Brandon. Several localities in Manitoba (Dawson). “ In ponds between Forts Ellice and Pelly ; abundant in Great Playgreen Lake ” (Bell).

- Ancylus parallelus** Haldeman.—Pine Creek, one specimen.
Rainy River ; Lake of the Woods (Dawson).
- A. singularis** ——— ?—Souris River (Dawson).
- Valvata tricarinata** Say.—Small, depressed form. Pine
Creek, common. Found in the stomach of a sturgeon
caught in the Great Play Green Lake (Bell).
- V. sincera** Say.—Several bleached specimens from Pine
Creek.
- Amnicola pallida ?** Hald.—Bleached specimens were com-
mon in the denuded banks of the Red River at Winnipeg,
and of the Assiniboine at Brandon.
- A. granum** Say.—Pine Creek.
- 



DESCRIPTION OF A
NEW SPECIES OF PLANORBIS FROM MANITOBA.

By JOHN W. TAYLOR.



Planorbis umbilicatus.

Mr. R. M. Christy, who has paid several visits to Manitoba, kindly placed his collections in my hands for examination. Amongst the Planorbis from Brandon, Birtle, &c., there was a form which I could not with propriety refer to any described species, I therefore propose to name it as above. Mr. Nelson, who has studied the Limnæidæ, agrees with me in regarding the specimens as distinct from any previously described species.

Shell somewhat flat above, but slightly sunk in the centre, convex below, greyish-white, somewhat glossy, closely and distinctly striate in the line of growth, with stronger ridges at intervals, most visible on the under side. Periphery rounded, but slightly compressed at each side. Suture rather deep. Aperture oblique and somewhat cordiform. Umbilicus deep and narrowly funnel-shaped. Whorls $4\frac{1}{2}$, compact, gradually increasing in size and faintly keeled or angulated on upper side. Diam. $6\frac{1}{2}$ mill., alt. 2 mill.

The species bears some resemblance to *P. parvus* Say, but its somewhat funnel-shaped umbilicus is sufficient to at once separate it.



