

In conclusion, allow me to apologize for a small error which crept into the table of summaries of the 1931 nest, the addition of the time spent by the female brooding, reading as 12 hours 30 minutes, instead of 14 hours 30 minutes, thus making the length of each brooding 18 1-2, instead of 16 minutes, which errors have been rectified in the present table of summaries, of both nests, as herewith appended.

Species	Period of Observation 1933	Hours	No. of Times fed by Female	No. of Times brooded by Female	Total Time brooded by Female	Times faeces eaten by Female	Times faeces removed by Female	Remarks
Eastern Goldfinch ( <i>Spinus tristis tristis</i> ).	Sept. 4							1st egg hatched at 3 p.m.
	5	2½	2	2	1.15	2		
	6	5¼	7	9	4.32	7		
	7	2½	4	5	1.05	4		
	8	5¼	7	8	1.56	7		
	9	5¼	9	11	2.14	9		
	10	6¼	11	12	1.22	11	1	
	11	5¼	8	5	.30	8	3	
	12	6¾	9			4	5	
	13	6¾	10			3	7	
	14	5½	7				3	
	15	5¾	7				1	
	16							Not visited
	17	6¾	10					
	18	2¼	3					Young left the nest.
Totals		66	94	52	12.54	55	20	
Totals	Sept. 5-18. 1931	66	80	47	14.30	56	18	

	1933 nest	1931 nest
Average rate of feeding over the whole period—once every 42.1 minutes		—once every 49.5 min.
Average rate of feeding for the first seven days—once every 40.3 minutes		—once every 43.1 min.
Total time brooding . . . . .	12 hours, 54 minutes	—14 hours, 30 min.
Number of times brooded . . . . .	52	—47
Average length of each brooding . . . . .	14.9 minutes	—18 5 min.

A NEGLECTED WORK ON THE SHELLS OF QUEBEC

By A. LA ROCQUE

E

ARLY WORKS on Canadian Conchology are rather scarce so we should make the most of the ones we have. When Whiteaves asserted (1862:452) that “the papers published by Mr. Bell and Mr. D’Urban in the *Canadian Naturalist*,

together with another in the *Canadian Journal* by Mr. Williamson, contain all the published information on this subject” (mollusca of Lower Canada) he was omitting a paper which in many ways is one of the most remarkable we have. This was probably due to the scar-



city of the periodical in which it was published as Whiteaves, from all accounts, was a man incapable of doing an injustice. The paper in question is by Mrs. Sheppard and dates back to 1830. It was published in the *Transactions of the Literary and Historical Society of Quebec* for 1829, the full title being "On the Recent Shells which characterize Quebec and its environs".

Whiteaves was not alone in his neglect of Mrs. Sheppard. Although listed in Binney's bibliography (1863) it is not mentioned by Provancher (1890) and is absent also from many more recent works in which it should be found. Amongst those to quote Mrs. Sheppard are Dall (1905) and Simpson in his *Synopsis of Naiades* (1900).

We know very little about Mrs. Sheppard. She was probably the wife of William Sheppard, who, with his brother Peter, was a founder-member of the Literary and Historical Society. In the list of founders he is merely

William Sheppard, Esquire, but later his articles are by "Honble Wm. Sheppard, of Woodfield". He was three or four times president of the Society and the centenary volume (1924) mentions that his portrait is in the possession of the Society. In 1841 we find him listed with the corresponding members. It is probable, therefore, that the Sheppards lived in Canada some ten years. No doubt the archives of the Literary and Historical Society of Quebec could furnish more details on the Sheppards, the length of their stay and "Woodfield", their home.

Being concerned more particularly with the identity of the species mentioned in her paper, the writer has attempted to make a list of her species and their modern equivalents, which is given below. Had Mrs. Sheppard given the names alone, some of her records would be unrecognizable but fortunately she added short descriptive notes which in many cases enable one to identify the species. The species listed, with their modern equivalents are as follows:

1. *Unio sinuata*
2. *Unio radiata*
3. *Unio nanca*
4. *Helix hortensis*
5. *Helix*.....?
6. *Corocolla dubia*
7. *Succinea amphibia*
8. *Planorbis spirorbis*
9. *Planorbis alba*?
10. *Physa fontinalis*
11. *Physa subopaca*
12. *Lymnaea stagnalis*
13. *Lymnaea palustris*
14. *Paludina*.....?
15. *Paludina*.....?

- ?*Margaritana margaritifera* (Linn.)  
*Lampsilis radiata* (Gmel.) and perhaps some other species.  
*Elliptio complanatus* (Dillw.).  
*Cepaea hortensis* (Müll.).  
*Polygyra monodon* (Rackett).  
*Anguispira alternata* (Say).  
*Succinea ovalis* (Say) or near.  
 ?*Menetus exacuus* (Say)  
 ?*Gyraulus* or ?*Planorbula*.  
*Physa* sp.  
*Physa* sp.  
*Lymnaea stagnalis jugularis* (Say).  
*Stagnicola palustris* (Müll.) and possibly other species of the same genus.  
*Campeloma decisum* (Say) or near.  
*Goniobasis* or *Pleurocera*, more probably the former.

1. *Unio sinuata*: This is indentified as *Margaritana margaritifera* with some doubt. Of it Mrs. Sheppard says: "Shell ovate, oblong, compressed, sinuous; on the upper part thick, cardinal tooth lobed, and striated. Inhabits the Island of Orleans, not very common. I have sometimes found very small pearls in this species; it is a coarse large mother of pearl shell with a brown epidermis". There are quite a few species which might fit into the above description if some of their characteristics are disregarded. For instance *Elliptio complanatus* if one disregard the rich purple nacre; but Mrs. Sheppard noticed this and could differentiate *E. complanatus* which

she aptly describes under *U. nanca* (see below). She says nothing of laterals so if we suppose that her *U. sinuata* did not have any, the field is considerably narrowed. *Lasmigone costata* sometimes has a brown epidermis but the fluted posterior part of the shell would doubtless have been noticed, so that on the whole it is more probable that she really had *Margaritana margaritifera*. On the other hand I know of no other record of this species living in the St. Lawrence itself, although there are many for its tributaries. It may be that Mrs. Sheppard's shells were dead, washed on the beach of the Island of Orleans from some of the rivers up-



stream, which would account for their scarcity as compared with the other species which most probably live in the immediate vicinity.

2. *Unio radiata*: It is very probable that Mrs. Sheppard had some genuine *radiata* but since she fails to mention *Lampsilis ventricosa* and *L. siliquoidea*, both recorded subsequently for the St. Lawrence, it is possible that she lumped all three species under the one name. Her description is as follows: "shell obovate, convex, rather depressed, thin, transversely striated, broader on the anterior side than on the other; epidermis yellow, longitudinally rayed." This is quoted, probably from Lamarck; the following observations are her own: "Found on the beach at the Island of Orleans; the shell is much thicker than those from Saratoga, and is pink or flesh colour within."

3. *Unio nanca*: "Shell transversely oblong, beaks depressed, lateral; tooth deeply canaliculated."

"This species, much more common than either of the foregoing is likewise an inhabitant of the Island of Orleans; the shell is violet or clay colour within, and is rarely rayed, it is much lengthened the transverse way, and covered with a black or dark brown epidermis, under which is mother of pearl."

From the above this could be only one species, viz. *Elliptio complanatus*. It is possible, however, that specimens of *Ligumia recta* and *Elliptio dilatatus* may have been included. But the "violet or clay colour" combined with commonness would point to *Elliptio complanatus*.

4. *Helix hortensis*: There seems no reason to doubt this identification since none of the native species have the same striking colours. However, Whiteaves does not mention the species for Quebec. Provancher (1890:125) gives "Cap Rouge, Lyster, Anticosti, îles de la Madeleine et dans toute l'Europe" Hanham (1897:98) cannot have found it in Quebec since he took the trouble of introducing specimens from Gaspé and says: "I see no reason why this locality and climate should not suit *H. hortensis* L. as it has without doubt, the other introduced species". If we accept Mrs. Sheppard's record, it would seem that *C. hortensis* was to be found at Quebec as late as 1829 but died out some time between that date and the 1860's. It would be interesting to know if the species is to be found there now, as it has long been known for various localities along the St. Lawrence.

5. *Helix*.....?: "Shell thin, conoidal, perforated; spire very flat; margin of the lip reflected. Common in the same place with the

above (bank near the plains of Abraham); it is a much less shell, with a brown epidermis; the penultimate whorl has an elevated white ridge near the aperture, which appears to be some remains of the last year's lip."

The size (much less than *hortensis*), the brown epidermis, the commonness, the reflected lip, perforated umbilicus, conoidal shape and flat spire would point to *Polygyra monodon*, possibly variety *cava*, and this is strengthened if we assume that the "remains of last year's lip" is the white, lamellar parietal tooth.

6. *Corocolla dubia*: Mrs. Sheppard reproduces Lamarck's description, the significant (for us) passage being "shell.. on the upper part, with a sharp angular periphery". She goes on to say: "De Lamarck would, I think, range it under *corocolla*, and until it be ascertained to have been previously described might be called

*Corocolla dubia*. Shell orbicular, largely umbelicate; spire flat, whorls transversely striated, horn colour, spotted with brown. Common in the spring on the bank with the two foregoing shells; it is rather a pretty shell, often variegated with white and brown".

Any collector familiar with Canadian shells will recognize *Anguispira alternata* (Say) as did Dall (1905:49). Say's species was described some twelve years earlier in a paper which was probably not accessible to Mrs. Sheppard.

7. *Succinea amphibia*: This is most probably *Succinea ovalis* Say since Mrs. Sheppard says of it: "shell ovate, thin, pellucid, yellowish; spire short, dilated at the lower part, subvertical. Inhabits gardens on the St. Louis road; it is horn coloured, and very transparent."

*Succinea retusa* (Lea) could hardly be found in gardens and *Succinea avara* Say has an undilated spire and is far from transparent.

8. *Planorbis spirorbis*: "one side flat, the other subumbelicated, reverse; horn coloured.. Found in abundance in the water near Etchemin. If the "water near Etchemin" was a pool separate from the river, the species referred to may have been *Menetus exacuus* (Say) (one side flat, the other subumbelicated). If Mrs. Sheppard was familiar with the English *P. spirorbis* and had both a *Gyraulus* and a *Menetus* to name she would probably call the *Gyraulus P. spirorbis* and the *Menetus Planorbis alba*? (No. 9). But she distinctly states that her *Planorbis alba*? is "umbelicated on both sides" which is more like a *Gyraulus*, or possibly *Planorbula*. On the whole *Menetus exacuus* seems the most likely in this case.



9. *Planorbis alba*? : "Shell umbelicated on both sides; upper part of whorls flat, lower convex; aperture wide and angular. Found with the foregoing, but not so common, it is the *Helix alba* of Linnaeus, but, is not among De Lamarcks species". As stated above, this is either a *Gyraulus* or a *Planorbula*.

10. "*Physa fontinalis*: reverse, oval, transparent, smooth, horn coloured; spire short, subacute. Not very common, but is sometimes met with on the beach at the Island of Orleans."

11. "*Physa subopaca*: Shell reverse, oval, semipellucid, grayish yellow; spire short, acute. This species is rather more common than the foregoing, they are often found together at the Island; it resembles *fontinalis* but is not so transparent. It is yellow without, and white within."

The only difference mentioned between these two species is one of degree, viz. transparency. It would be hard to say what the modern equivalents are, but it may well be that a large collection from the Island of Orleans would clear up the problem.

12. *Lymnaea stagnalis*: "Found abundantly at Sorel". There is no reason to doubt this identification and although I have seen no specimens from Sorel, it is most likely that they belong to the subspecies *jugularis* (Say). Note the spelling of *Lymnaea*.

13. *Lymnaea palustris*: That the species is correct is beyond doubt. The habitat is typical, viz. temporary pools formed by melted snow. It would be interesting to know if M. S. Sheppard found her two *Planorbis* here also; in that case one of them would be *Menetus excavatus* without doubt.

14. *Paludina*.....?: "Shell white, epidermis olive; spire the length of the aperture; last whorl inflated. Inhabits the Island of Orleans".

15. *Paludina*.....?: "Shell pale buff; spire longer than the aperture; top obtuse. Found with the foregoing on the beach at the Island; the whorls are not so much inflated as those of this genus generally are, but I think it would not range under any other; it has bluish bands of gray round the top of the whorls."

No. 14 is certainly a *Campeloma*; whether *decisum* or another species must remain undecided until the genus is re-studied thoroughly. At present specimens from the Island of Or-

leans and indeed the whole Lower St. Lawrence drainage would be called *decisum* but certain well-marked varieties if not species exist in Quebec which still await study.

No. 15 is probably a *Goniobasis*, *livescens* or near. The obtuse top might exclude the possibility of its being a *Pleurocera*.

Whiteaves' note on *Melania niagarensis* Lea (1863:102) is of peculiar interest when compared with the above; "St. Lawrence, from Quebec to Montreal. At Quebec I obtained only the pale yellowish, unbanded variety."

To Mrs. Sheppard, then, goes the honour of publishing the first list of Quebec shells. Six undoubted species and nine doubtful ones are listed which is remarkably good considering the books at her disposal and the state of conchology at that time. It is hoped that her work will soon be recognized by the naming of a Canadian species in her honour.

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