

## FOSSIL LAND SHELLS OF THE OLD FOREST BED OF THE OHIO RIVER.

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During the spring of 1902, owing to the unusually heavy rains which caused much cutting to be done on the banks of the Ohio and Great Miami rivers, near Lawrenceburg, Indiana, I had a fine opportunity to examine this interesting formation, the Old Forest bed, from a conchological point of view.

I had many years previously found large numbers of broken and bleached shells of species which are foreign to this locality in drift piles of the Great Miami and Ohio rivers, which I had always put down as dead specimens which had floated from some point far above where they were found. I found that this conclusion was erroneous and that these shells were washed from the deposit which contained them, and floated to the various drift piles where they first attracted my attention.

The Old Forest bed is a stratum of several feet in depth, six to eight feet below the present surface of the bottom lands of the Ohio, and contains in many places the well-preserved remains of mammoth trees; these are covered with a thick layer of yellow clay of an exceedingly hard and solid texture, which renders very difficult the extraction of fossils so delicate in structure as the land shells. About the only satisfactory way to obtain good specimens is to wash out with water until the clay is softened and then, if good luck follows you, you may obtain a respectable specimen. The use of a knife or chisel is absolutely useless, as in nearly every case the fossil extracted by these means is cracked or broken.

The comparison between these fossil forms and the species now found in this section is extremely interesting and worthy of study. To give a general idea of the species and to illustrate the difference between the fossil and recent faunas, I give the following list with notes on each species, which will show clearly what time has done to modify the molluscan fauna to the changed conditions of the present time.

It is remarkable how well the red coloring matter of all species is preserved, particularly in the case of *P. alternata* Say.

*Vallonia pulchella* Mull. Traces only of this minute shell.

*Polygyra tridentata* Say. Not many found, and these much more elevated and more deeply striated than the local living specimens.



*Polygyra tridentata* Say. Variety, region of the mouth much compressed and very deeply striated.

*Polygyra inflecta* Say. A few broken specimens.

*Polygyra profunda* Say. Very large well-preserved shells, heavy, and bands very plainly marked.

*Polygyra albolabris* Say. Very scarce.

*Polygyra exoleta* Binn. Common and of usual form.

*Polygyra multilineata* Say. Perhaps about the most plentiful of all the species found. This shell has never been found alive within twenty miles of this deposit.

*Polygyra palliata* Say.

*Polygyra appressa* Say. Several broken specimens.

*Polygyra elevata* Say. Fairly common and well preserved.

*Polygyra pennsylvanica* Green. Quite common in the deposit, but rare in this vicinity alive, only ten or twelve specimens having been found in the last six years after careful search.

*Polygyra thyroides* Say. Good specimens and fairly common.

*Polygyra mitchelliana* Lea. Common in the deposit, but rare and very local alive, only one locality known near Lawrenceburg.

*Polygyra stenotrema* Fer.

*Polygyra monodon* Rack. Very rare.

*Pupoides marginatus* Say.

*Bifidaria contracta* Say.

*Bifidaria armifera* Say. Common.

*Cochlicopa lubrica* Mull. A few broken specimens.

*Circinaria concava* Say. Quite common.

*Vitrea hammonis* Strom. Several broken shells.

*Gastrodonta ligera* Say. Common and in good condition.

*Pyramidula alternata* Say. Very large forms with distinct and beautiful color markings.

*Pyramidula solitaria* Say. Plentiful, large, heavy shells.

*Pyramidula perspectiva* Say. Rare.

*Pyramidula striatella* Anth. Rare.

*Helicodiscus lineatus* Say. Rare and broken.

*Succinea* sp. Very large, quite common, and in fine condition, nothing nearly as large found here alive.

*Pomatiopsis lapidaria*. Common. I have never taken this shell alive in the vicinity of Lawrenceburg.

Subsequent search will no doubt increase the numbers of this list,



as only those shells are mentioned which are perfect enough to render identification complete.

*Poly-multilineata* Say, which occurs plentifully in the middle portions of the State, seems at Lawrenceburg to be conspicuous by its absence, but is represented in the fossil state in large numbers, and is an exceedingly well-developed form for this species. In fact all these fossils are much larger and better developed than the species which are found alive here at the present time, with the exception of *Pol. albolabris* Say., which is in the deposits a very rare shell, but most abundant in the surrounding woods. This may be due to the fact that *albolabris* is a thin and fragile shell, and has not been able to withstand the pressure of the surrounding soil so well as *elevata* and its more solidly-built brethren. However, this theory would not seem to hold good, as *Succinea*, one of the most fragile land shells, occurs in numbers, of large size, and in a splendid state of preservation.

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#### A NEW HELIX FROM CALIFORNIA.

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BY J. ROWELL.

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*Epiphragmophora exarata* var. *rubicunda* Rowell.

Shell umbilicate, conic, less depressed than *exarata*, rather thin, sculpture somewhat malleated, the malleation lying in ridges parallel with lines of growth, color dark chestnut-brown, with one black band, summits of ridges and malleation dark orange-red, interior ruby-red; whorls seven, rounded, suture impressed, the upper whorls much less wrinkled than in *exarata*.

Alt. 21, diam. 27-30 mm. (Occidental.)

Alt. 25, diam.  $31\frac{1}{2}$  mm. (Freestone.)

Habitat, Sonoma Co., on a high, dry ridge, in the town "Occidental," on our "Cal. North Western R. R." I have visited the place three times, hoping to get other mature shells besides my original pair, but have searched in vain. All around are *exarata* proper and a few *infumata*, in the redwoods. But on my last trip, I stopped over at the town "Freestone," six miles this side of Occidental; I chose the place because there the redwoods and the open country meet, and I thought that for this reason it would be the right place for my shell, and a dense fog helping me, I was delighted to find quite a number of fine specimens.



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