

A clue to the manner of introduction may be found in the fact that it is one of the favorite aquarium snails, and is sold in considerable numbers by dealers in aquariums and aquarium supplies under the name of "African or Paper-shelled Snail." The same people supply aquatic plants, and snail eggs might be easily distributed by these.

An analogous case is furnished by the discovery of several small "Cumberland Terrapin" *Chrysemys elegans*, one of the handsomest of our aquatic turtles, and native to the central states drained by the Mississippi (Indiana, Kentucky, etc.) Large examples of these are found in the markets of Chicago; smaller ones are sold at San Francisco by dealers in pets, under the name of "Japanese" or "Coin" turtles. Many purchasers, finding their pets not thriving in captivity, or becoming tired of them, sometimes bring them as donations to the Steinhart Aquarium, or apparently release them near or at the pools in the park where they can often be seen basking on stones. All that have been collected thus far had not reached sexual maturity, so that the species may be said to be introduced but not naturalized.

It is probable that *Lymnaea auricularia* may have been carried from place to place in the same manner and for the same reasons. The species is sufficiently known to attract attention still. It is worthy to note that all of the occurrences are of the species living under artificial surroundings. Who will be the first to find it established in a natural body of water? Our specimens are large and handsome, being over 25 mm. in altitude. The periostracum is a light straw color and the shells are much thinner and more diaphanous than the specimens compared from England.

Records of this species in North America are scarce. Baker<sup>1</sup> in 1917 listed it from a greenhouse in Chicago, Illinois, and from Brooklyn, New York. Hannibal in 1912<sup>2</sup> recorded it from Utah but probably through errors in synonymy. In the same year Henderson<sup>3</sup> did find the species in an artificial pond

<sup>1</sup> *Lymnaeidae of North America*, 1911, p. 182.

<sup>2</sup> *Proc. Mal. Soc. London*, Vol. 10, 1912, p. 140.

<sup>3</sup> *NAUTILUS*, Vol. 26, 1912, p. 84.

in Colorado Springs, Colorado. Later<sup>1</sup> he added Dotson Reservoir near Fowler, Colorado, to the known localities.

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#### VAGABONDING FOR SHELLS

BY P. S. REMINGTON, JR. AND W. J. CLENCH

The authors have been impelled to write this article because they feel that they have accomplished something of value to conchology, and because they hope that their account of it may induce others to attempt similar trips. The "expedition" was made under the auspices of the Museum of Zoology at the University of Michigan, the expenses of the trip being borne by the Museum and by Dr. Bryant Walker of Detroit. The greater part of the material collected will eventually go to the collections of the above named. Thanks are due to Dr. Walker and to Mr. Calvin Goodrich for help in the way of advice, suggestions as to the best places to collect, and gifts of maps and other equipment. A formal report of the species collected will come out later.

The purposes of the trip were several. In the first place, we wanted to collect as large a series of *Physa* as possible to provide more material for Clench's doctoral thesis, which is on the *Physa* of the U. S. east of the Rocky Mts. We wished to get our *Physa* in alcohol for anatomical study, for there is a scarcity of such material. Secondly, we were anxious to collect through the Tennessee River system, particularly the upper portion, which neither of us had ever seen, and which is one of the richest collecting fields in the country. We also had a list of various places, furnished us by Mr. Goodrich, which was desirable to collect in either because they were new territory, or because they were the locality of certain doubtful species. Most of these we cleaned up. Last, but not least, we were out to get

<sup>1</sup> *NAUTILUS*, Vol. 32, 1918, p. 71, and *Univ. Colo. Studies*, Vol. 13, No. 2, 1924, p. 162.

Newington  
Clench  
1925

head is one of the high lights of the summer. The road into the Cove, while in good shape, is surely the crookedest road in the world, for its length. Coming out we counted 226 turns in ten miles, many of the hairpin variety. This was Paul J. Adams' old stamping ground, and we left our machine in the barn of a friend of his, made up our packs and started on the hike up. These mountains are the highest east of Rockies, and though this one was only about 5,500 feet elevation (Thunder Head), it seemed much more before our tired legs reached the top. The going was made a little easier by picking up an occasional *Polygyra andrewsi* Binn. A dozen of these will fill your pack. Next to *P. chiltonensis* Lewis, also found in these mountains, this is the queen of the *Polygyras*. Adams assured us that in a wetter season, land shells would have been much more plentiful. We saw far too few. We made the top in a cold fog, and hastened to seek shelter in the cabin of a cattle herder, old Tom Sparks, another friend of Adams. Early in the morning we tumbled out and went up the crown of the mountain just over the North Carolina line where we got a superb view of the rugged peaks. Then back for a hasty breakfast and the long pull down which seemed even harder on the legs than the hike up. Shortly after noon we got back to the car, packed up and pulled out. In packing we missed a bag containing two dozen eggs we had just bought and concluded the farmer's dogs must have gotten them. About a week later, Clench, after much complaint from the other two on the condition of his duffle bag, decided to clean it out and found the whole two dozen where the farmer had put them to be out of reach of his dogs! Curtain! We are still laughing at that.

We now turned north to Knoxville, stopping just once to collect several quarts of big *Pleurocera* from Nale Creek. We were in a hurry now because Clench felt an attack of his old malaria, contracted the previous summer, coming on. When we reached Adams' home in Knoxville, Clench was just able to wobble up to bed. Strong doses of quinine brought him around, however, and two days later he was out collecting again. We cannot express enough gratitude for the kindness and hospitality which the Rev. Mr. and Mrs. Adams showed us then and later.

As soon as Clench was over his attack we made a trip to the Holston River in company with the veteran collector Manley D. Barber, a resident of Knoxville and Rev. Mr. Adams. Mr. Barber promised us some *Io* on a shoals about twelve miles up the Holston, and was able to make good on his promise. For the first time we took *Io* in some quantity, nearly 200, as well as many other shells. These *Ios* were big spiny fellows, possibly typical form *spinosa*. On the way back we collected in Swan Pond Creek and had very good success. While waiting for Clench to get well, trips were made to the Tennessee River, with poor success, and to First Creek with wonderful luck. At the latter place, although the stream was quite cluttered with rubbish, the water was literally crowded with *Pleurocerids*. Never have we seen shells in such quantity. We filled up all our cans and buckets in a short time—we could have filled barrels—and then turned home. It would pay to make a complete survey of that stream, it is so rich, and we hope Adams will do it. Another bit of collecting we did in Knoxville was a search for land shells at Cherokee Bluffs and for *Helix nemoralis* Linn., introduced near the campus of the University of Tennessee. About 100 live specimens of the latter were carried to St. Louis by Remington and "planted" on the grounds of the Principia School.

On Aug. 30 we left Knoxville on the last leg of the trip. Our intention was to collect farther up on the Clinch and the Powell and perhaps run into Virginia. We were going after *Io* in quantity now. Leaving Knoxville we collected in Second Creek, Knob Fork Creek and Beaver Creek, and struck the Clinch at Clinton. Here we collected a big series of *Campeloma* and *Pleurocera*. A few miles beyond we again hit the Clinch at the old Moore's Ferry and found the usual run of shells, in quantity, and about 100 *Io*, small, of the form *brevis*. We now headed for the mouth of the Powell River where we wanted to get a big series, as there is some talk of a dam being built there. We found a few *Io* here in both the Clinch and Powell, as well as some fine *Streptobasis*, *Anculosa*, naiades, and the river forms of *Pleurocera*.

Another stop was made on the Clinch near Maynardsville,

Tenn. where we secured a fine catch of mussels. Then we made a detour to strike the Powell near Cumberland Gap, and had very good success there. For the first time we took over 100 *Io* which were nearly smooth. It would be hard to say what these shells are, as they intergrade, but they range between form *lyttonensis* and form *powellensis*. We kept zigzagging between the Powell and the Clinch here, until we turned northeast at Tazewell toward Kyle's Ford on the Clinch. A collection made in the Little Sycamore Creek was remarkable for having a few *Anculosa* in it, as well as some forms of *Pleurocerids* new to us. *Anculosa* were not usually found in small creeks. This day we made camp just before a pelting rain caught us. We saw the storm coming and stopped at the first handy spot, but quickly moved after the storm when we found we were camped close to a very dead calf! Once before we found we had camped near a departed mule. We favor a law in Tennessee requiring farmers to bury deceased animals.

We came out on the Clinch about six miles below Kyle's Ford, Tenn. and proceeded to collect all the way up to the ford. The river here is a series of shoals, quite clear, and we could see the *Ios* on the ledges. At Kyle's Ford they were particularly thick, as many as ten being brought up in one scoop of the hand. These *Ios* are from the type locality for the form *brevis*. It was thrilling work, though back-breaking, to grope for shells and keep a footing in the swift water. But our long-awaited dream of collecting *Io* had come true and we chalked off another aim achieved in conchology. We still have a few left. This was the last collecting we did, for our funds were almost exhausted and our time was about up too. Indeed, we had stretched the appropriations for two so as to cover expenses for three, and we considered that good managing. On Sept. 5, we drove back to Knoxville. All that remained now was to dispose of the car, pack our outfit and take the train back to Ann Harbor. The Rev. Mr. Adams kindly took the car off our hands and we were glad to know it was with friends. We feel very tender toward that car. On Sept. 8 we reached Ann Arbor again, having stopped in Detroit a few hours to report to Dr. Walker and spent a pleasant hour with him.

Our work, while very scattering, did approach completeness on the Little and Clinch Rivers—we collected at eleven stations on the latter river. As the upper reaches of the Clinch have been explored by Goodrich and Ortman, the Clinch may be said to be thoroughly explored now. We estimated that we brought back over 250,000 specimens. Dr. Walker says no such volume of work has ever been done on the *Pleuroceridae* at one time. The whole work was really in the nature of a survey, and when the results are made clear, will furnish a basis for further work later. We want however, to give the *Ios* time to come out of their hiding places again. It is reported that the canned-bean industry had a big year! A wonderful trip, vagabonding for shells!

#### PUBLICATIONS RECEIVED

Pelecypoda from the Marine Oligocene of Western North America. By Bruce L. Clark (Univ. Calif. Pub., Bull. Dept. Geol. Sciences, Vol. 15, No. 4, pp. 69-136, pls. 8-22, 1925). Forty-four new species are described and figured with notes and figures of many others.

The fossils of the Lower San Pedro Fauna of the Nob Hill Cut, San Pedro, California. By T. S. Oldroyd (Proc. U. S. Nat. Mus., Vol. 65, Art. 22, pp. 1-39, pls. 1-2, 1924). Twenty-two new species and subspecies are described from this Pleistocene formation which contains some 242 species of shells.

Discovery of a Balkan Fresh-water Fauna in the Idaho Formation of Snake River Valley, Idaho. By W. H. Dall (U. S. Geol. Survey, Prof. Paper 132-G, pp. 109-115, pl. 26, Nov., 1924). Seven new species, including four of the remarkable genus *Orygoceras* are described. A new genus *Peyetia* is proposed, type *Latia dalli* White.

OPISTHOBANCHIATE MOLLUSCA. By Frank M. MacFarland (Proc. Cal. Acad. Sci., 4 Ser., Vol. 13, pp. 389-420, pls. 10-12, Nov., 1924). One new species *Aglaja bakeri* and a new genus *Tritachia*, type *Tritachia ? diomedea* are described and figured.