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ON A RECENT COLLECTION OF PENNSYLVANIAN MOLLUSKS FROM THE OHIO RIVER SYSTEM BELOW PITTSBURG.

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Owing to the steady extermination of the molluscan life of the Ohio river in western Pennsylvania, due to the pollution and damming of the waters of that river and of the Monongahela, and to a smaller extent of the Allegheny river, any information relating to the species still existing in these waters must be quickly put on record to be preserved. It is the aim of this paper to give a list, briefly annotated, of the fresh water species recently collected by the writer in the vicinity of Pittsburg. While the time devoted to this collection was limited to less than a week's work, and the number of species taken do not duplicate all those hitherto secured by local collectors in that region, it seems desirable to publish, if only to inspire others more favorably situated than myself to record their knowledge in this line before it is too late. Indeed, it is remarkable, when we consider the amount of molluscan research carried on by the conchologists of Pennsylvania that as yet nothing in the nature of a faunal list of the aquatic mollusca of western Pennsylvania has yet appeared.* Before giving the list it is proper to enumerate some of the agencies which are surely accomplishing the extinction of so much of the fluviatile life of the Ohio river and its tributaries. Above the city of Pittsburg the Monongahela is bordered for the greater part of its navigable length with factories, furnaces, refineries, mines, and oil and gas wells, whose refuse products are continually draining into the river. The sewage of the towns on this river is also a factor in its pollution. Great as this pollution may appear, it is not likely that it would cause the death

*Some *Unionidae* from the Allegheny river in Warren county, Pennsylvania, were listed by W. B. Marshall in *Bulletin of the New York State Museum*, Vol. 1, but as no localities are given in the list it is impossible to determine what species were taken in Pennsylvania and what in New York.

of many mussels and fish, which now no longer exist in the lower half of the Monongahela, if the waters had their free course; but the damming of the river has so concentrated this sewage during low water that the imprisoned animals have no relief from the free flow of the current nor means of escape from the limits of the dammed area. The Monongahela is said to be now dammed for purposes of navigation throughout its entire length in Pennsylvania and for some distance farther into West Virginia. Old rivermen told me that it was useless to try and get live mussels below Cheat river, though only a year since, a small collection of uniones from the Monongahela near Charleoi, Washington county, was made for the Carnegie Museum. It is noteworthy, however, that most, if not all, of these were "dead" shells. At McKeesport, the junction city of the Monongahela and Youghiogheny rivers, I was unable to find any evidences of molluscan life in the waters of either river, nor were any dead shells to be found on the mud banks and shoals exposed by the very low stage of water then prevailing. A boatman stated that there was little hope of finding any live mussels below Connellsville on the Youghiogheny.* A similar condition exists in the Allegheny river above Pittsburg, as far as my search extended a few miles above Sharpsburg, only dead shells of the larger uniones being found where three years since a member of the High School Naturalists' Club of Pittsburg told me he had secured the living animals. The same remarks apply to Chartier's creek within the city limits and flowing into the Ohio river at McKees rocks, just above the Davis Island dam. A few dead shells of *U. ligamentinus* were picked up in the bed of this creek. Following the instructions of Mr. George H. Clapp, of Edgeworth, Allegheny county, Pa., who kindly gave me the full benefit of his intimate knowledge of the Ohio river between his home and Pittsburg, I searched for water mollusca at the lower end of Neville Island opposite Coraopolis, but without success, only a few cast-up shells of *ligamentinus* and *crassidens* being noted. Just as I had given up the search and was waiting for a trolley car on the bridge above Coraopolis, connecting the city with Neville Island, I espied some live uniones in the shallow running water of the "back river" which flows beneath the

* This is, no doubt, largely due to the immense volume of "mine water" now discharged into the river. This "mine water" is heavily charged with sulphuric acid, due to the leaching out of the sulphate of iron in the coal measures. At times of excessively low water the percentage of free acid in the water is so high that works along the banks of the Youghiogheny and Monongahela rivers as far down as Pittsburg have been forced to suspend operations, due to the eating out of the steam boilers, and the railroads which use this water in their engines, for lack of a better supply, have spent large sums of money in putting up treating tanks in which to neutralize the acid before pumping into the boilers.—G. H. C.

bridge at that point above it, the extreme low water dam, is more or less supplied along the bottom. From the river and other sources exert no influence on the existence of the Allegheny county to Beaver, Beaver junction of Beaver mouth of Race were very scarce where the less part Below this, about dead or dying, I me had come to also contain an in the Beaver rrence county, all obtaining among normal.

Mr. Clapp has and make such notes his initial the author was uniones in the the historic collection final determination former, and Pre debited for service in reference in referred adopted for the of *Unionidae* is

Aurontia ca
Beaver R., 14.

bridge at that point. Here, and for a distance of two and a half miles above it, the small stream, to which the "back river" dwindles at extreme low water on the south side of Neville Island below the wing dam, is more or less thickly populated with living uniones. This stream is supplied almost wholly by fresh water springs rising along its bottom. From the absence of live mollusks in any part of the main river and other parts of the "back river" where these fresh springs exert no influence, it is just to conclude that to these alone is due the existence of the only living uniones which I was able to locate in Allegheny county. A special collecting trip for mussels was taken to Beaver, Beaver county, search being made in the Ohio river at the junction of Beaver river, and at several points below Beaver to the mouth of Raccoon creek and up that creek two miles. Living shells were very scarce anywhere along this route, most of them being taken where the less polluted waters of the Beaver joined those of the Ohio. Below this, along the bed of the Ohio, nearly all the uniones found were dead or dying, a condition of affairs which the ferryman at Vanport told me had come to pass largely in the last two years. The subjoined list will also contain an enumeration of the species found during a day's hunt in the Beaver river below Wampum, in the southern border of Lawrence county, about fifteen miles north of Beaver. The conditions obtaining among the water mollusca in that locality are probably normal.

Mr. Clapp has kindly consented to read the manuscript of this paper and make such annotations as may be of special interest. To such notes his initials are appended. In the identification of this collection the author was accorded every facility afforded by the collection of uniones in the Carnegie Museum, identified by Mr. Simpson and by the historic collections of the Academy of Natural Sciences, where the final determinations were made. To Dr. W. J. Holland, of the former, and Prof. Henry A. Pilsbry, of the latter, I am especially indebted for services rendered in this connection. For sake of convenience in reference the nomenclature of Lea's Synopsis (1870) is adopted for the Uniones; and the sequence of the genera and species of *Unionidæ* is alphabetic.

Annotated List of Species.

Family UNIONIDÆ.

Anodonta edentula Say. Ohio R., Coraopolis, 16; Beaver, I;
Beaver R., 14.

that my series represents two species, but the task of separating them must be left to a specialist.

Unio ovatus Say. Ohio R., Coraopolis, 29; Beaver, 1; Beaver R., Wampum, 3.

Unio parvus Bar. Beaver R., Wampum, 1.

Unio phascolus Hild. Beaver R., Wampum, 37.

Unio pilaris Lea. Ohio R., Coraopolis, 1.

Unio plicatus Lesueur. Ohio R., Beaver, 1; Beaver R., Wampum, 10. A more careful examination may show some of these to be *undulatus*. The distinction between these two species as identified in the Academy collection is not correlated by constant differences.

Unio pressus Lea. Beaver R., Wampum, 3.

Unio pustulosus Lea. Ohio R., Coraopolis, 1; Beaver R., Wampum, 8.

Unio rectus Lam. Ohio R., Coraopolis, 4; Beaver, 5.

Unio rubiginosus Lea. Ohio R., Coraopolis, 5.

Unio securis Lea. Ohio R., Coraopolis, 1.

Unio triangularis Bar. Ohio R., Coraopolis, 17; Beaver, 10; Beaver R., Wampum, 15.

Unio trigonus Lea. Ohio R., Coraopolis, 3. These specimens are so young that their identification is not satisfactory.

Unio tuberculatus Bar. Ohio R., Coraopolis, 1; Beaver, R., Wampum, 2.

Unio verrucosus Bar. Ohio R., Coraopolis, 2; Beaver, 1; Beaver R., Wampum, 2.

Family CYRENIDÆ.

Sphaerium stamineum Conr. Ohio R., Coraopolis, 20; Raccoon Creek, Beaver Co., 4.

Sphaerium striatinum Lam. Ohio R., Coraopolis, 15; Raccoon Creek, Beaver Co., 3; Beaver R., Wampum, 2.

Family PLEUROCERIDÆ.

Goniobasis depygus (Say). Ohio R., Coraopolis, 150; Beaver, 10; Beaver R., Wampum, 60;

Pleurocera canaliculatum Say. Ohio R., Coraopolis, 50; Beaver, 16.

Family VIVIPARIDÆ.

Campeloma subsolidum (Anth). Beaver R., Wampum, 20.

Family PHYSIDÆ.

Physa heterostropha Say. Ohio R., Coraopolis, 3; Beaver, 20; Allegheny R., 6 m. Isl., Pittsburgh, 60; Beaver R., Wampum, 27.