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A COMPARISON OF

EARLY INDIAN MIDDENS

WITH TODAY

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ABSTRACT

In prehistoric times the upper Ohio River supported a population of at least 32 species of freshwater mussels. By the turn of the Twentieth Century at least seven species had been extirpated from the river. At the present time there are only 13 of the original 32 species still occasionally found in the river. The river habitat has been modified by man and at least 15 species new to the river have moved in. While the total number of individuals currently living in the river is only a small percentage of what it was prehistorically, the total number of species has only changed from 32 to 28.

A survey of the freshwater naiads of the upper Ohio River was conducted by a team of biologists from Marshall University during the summer of 1979 (Taylor, 1980). This work was conducted with support by the United States Army Corps of Engineers, Huntington/Pittsburgh Districts. As a result of the survey, it was found that today there exists a fairly diverse naiad faunal assemblage (composed of at least 27 resident species) in this part of the river. Upon comparing these data with those presented by Ortman (1921) it is immediately obvious that radical changes in the faunal make-up have taken place since the turn of the century.

Within the past 200 years man has severely modified the river through industrial and human pollution, damming and dredging. The Ohio River is a much different river from the pristine Ohio that freely flowed for eons of time prior to the coming of European man. Native Americans, in apparently large numbers, had lived in harmony with the river utilizing its resources in moderation and adding nothing which would seriously harm or modify the river.

The habit by some American Indians of disposing of their wastes in garbage pits has provided contemporary paleoecologists with a very useful tool through which much can be learned about the lifestyle of these primitive people. A major component of most midden piles, along

this portion of the river, is a large amount of well-preserved freshwater mussel shell material. Early man used the mussel meat as a food at least part of the year, and the shells were ground and used as a tempering agent in the manufacture of clay pottery. Relatively few of the shells were incorporated into pottery; the majority was discarded after the flesh had been removed for human consumption. These shells remain so well preserved that even today, using conchological characters only, they can be readily identified to species level.

Method

The initial phase of this study was a boat survey of the freshwater mussels which presently (1979) inhabit a 340-mile long portion of the Ohio River between Pittsburgh, Pennsylvania and Greenup, Kentucky. Collecting techniques included brailing, handpicking in the shallows and collecting on the banks where muskrats had disposed of empty shells after eating the flesh. The shells were then identified, cataloged and accessioned into the Marshall University Malacological collections.

Literature records from Parodiz (1953) and Stansbery (1977) provided information on two sites. We report the results, in this paper, of the excavation of three additional sites. Figure 1

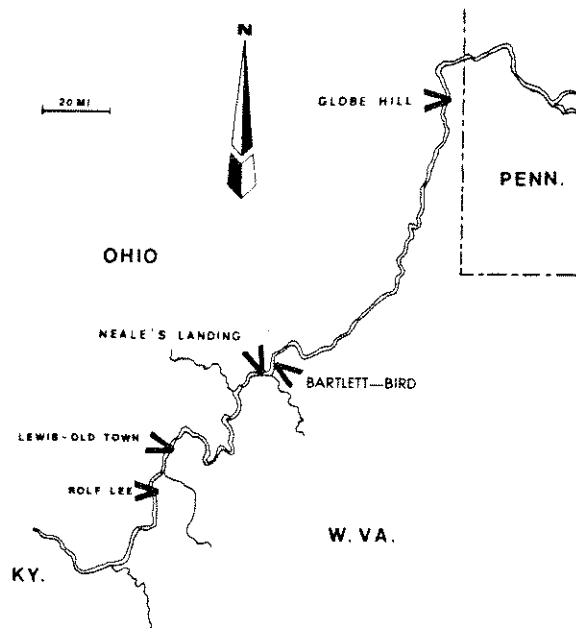


FIG. 1. Map of the upper Ohio River showing the approximate location of the archeological sites bearing freshwater naiads.

shows the respective archeological sites, while Table 1 gives additional pertinent information. In addition, the published works of Ortmann (1921) and Rhoads (1899), in conjunction with Carnegie Museum records, were used to determine the status of freshwater mussel populations in the upper Ohio River at the turn of this century.

Results and Discussion

By combining the data derived from all five archeological studies we were able to produce a composite list which shows that within the last 2,000-or-so years at least 32 species of mussels have lived in this part of the Ohio. By the middle 1800's the radical modification of the Ohio River (required for navigation) had begun, and in addition the large industrial complexes and cities along the Ohio began using the river as a waste disposal system. Because of these alterations Ortmann in 1921 was unable to find seven of the 32 species used by the Indians. Those species which were present in goodly numbers in earlier times, but which were extinct in the river by 1900, are listed in Table 2.

The misuse and modification of the river has continued until the present. Between the years of 1900 and 1980 an additional 12 species have been eliminated (Table 3). Of the original 32 species of mussels which inhabited the Ohio River in large numbers as recently as the 1600's, only 13 were found in the 1979 survey. Nineteen species had been extirpated from the entire upper Ohio over a relatively short period of time.

The picture is not, however, as bleak as it may seem. Although the river is still far from being clean, steps have been taken by state and federal agencies that will insure a continued improvement in water quality and thus improve the habitat. The fact remains that while water quality may someday improve to an acceptable

Table 1. Additional information on the archeological sites.

Site Name	Investigator	Excavation Date	Habitation Date	No. Species Identified
Globe Hill	Parodiz	1953	2000 B.C.	7
Neale's Landing	Stansbery	1977	1600 A.D.	24
Lewis-Old Town	Taylor and Spurlock	1979-80	1350 A.D.	23
Rolf Lee	Taylor and Spurlock	1979-80	1600 A.D.	28
Bartlett-Bird	Taylor	1980	1300 A.D.	26
Composite Number				32 species

TABLE 2. *Mussel species which became extinct in the Ohio River between 1600 and 1920.*

<i>Plethobasus cicatricosus</i> (Say, 1829)
<i>Pleurobema clava</i> (Lam., 1819)
<i>Pleurobema sintoria</i> (Raf., 1820)
<i>Pleurobema rubrum</i> (Raf., 1820) (= <i>plenum</i>)
<i>Epioblasma flexuosa</i> (Raf., 1820)
<i>Epioblasma torulosa</i> (Raf., 1820)
<i>Ptychobranthus fasciolaris</i> (Raf., 1820)

TABLE 3. *Species extirpated from the Ohio River between 1920 and 1980.*

<i>Plethobasus striatus</i> (Raf., 1820)
<i>Plethobasus cyphyus</i> (Raf., 1820)
<i>Quadrula cylindrica</i> (Say, 1817)
<i>Elliptio dilatata</i> (Raf., 1820)
<i>Cyprogenia stegaria</i> (Raf., 1820)
<i>Actinonaias l. carinata</i> (Barnes, 1823)
<i>Obovaria retusa</i> (Lam., 1819)
<i>Obovaria subrotunda</i> (Raf., 1820)
<i>Ligumia recta</i> (Lam., 1819)
<i>Lampsilis abrupta</i> (Say, 1831) (= <i>orbiculata</i>)
<i>Lampsilis ovata</i> (Say, 1817)
<i>Obovaria olivaria</i> (Raf., 1820)

TABLE 4. *Mussel species which have established residence in the upper Ohio River in historical times.*

<i>Anodonta imbecillus</i> Say, 1829
<i>Anodonta g. grandis</i> Say, 1829
<i>Anodonta g. corpulenta</i> Cooper, 1834
<i>Strophitus u. undulatus</i> (Say, 1817)
<i>Lasmigona costata</i> (Raf., 1820)
<i>Lasmigona complanata</i> (Barnes, 1823)
<i>Lasmigona compressa</i> (Lea, 1829)
<i>Quadrula quadrula</i> (Raf., 1820)
<i>Fusconaias flava</i> (Raf., 1820)
<i>Unio merus tetralasmus</i> (Say, 1830)
<i>Leptodea fragilis</i> (Raf., 1820)
<i>Potamilus alatus</i> (Say, 1817)
<i>Potamilus ohioensis</i> (Raf., 1820)
<i>Toxotasma parvus</i> (Barnes, 1823)
<i>Villosa i. iris</i> (Lea, 1829)

level the river is irreversibly altered as a result of damming. The river exists today as a series of impoundments rather than a free-flowing river.

As the river habitat became intolerable for some naiad species, it became acceptable for

others. There is a totally new mussel fauna presently found in the Ohio River. In addition to the 13 remaining species of the original fauna, there are 15 species which have established residence within the last century (Table 4). None of these species has been found in the archeological material from the five test sites. While none of these species is presently found in commercially harvestable quantities, most are found in goodly numbers throughout the entire upper Ohio. One noteworthy example is *Quadrula quadrula*. Rhoads (1899) stated that this species did not extend above Cincinnati, but it is presently found in many large beds throughout the study area.

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