

MUSSELS IN THE UNIQUE NICKAJACK DAM CONSTRUCTION SITE, TENNESSEE RIVER, 1965. — Nickajack Dam is located at Tennessee River Mile (TRM) 424.7 in Marion County, Tennessee, just northwest of the juncture of the state lines of Alabama, Georgia and Tennessee. This dam is about 6.4 mi. below the site of Hales Bar Dam, which it replaced, and below Walden Gorge, which Ortman (1925) used to separate the mussel faunas of the upper and lower Tennessee River. The mussels discussed here were collected 16 June 1965, the day the coffer dam was dewatered and the riverbed exposed for construction of the dam.

Total drainage above Nickajack Dam includes 21,870 sq. mi. or about 1/2 of the total Tennessee Valley drainage area. Average annual rainfall is 51 in. (129.5 cm). Approximate average annual temperature is 60.8°F (16°C). Average unregulated flow (1875-1965) at Nickajack Dam is 38,000 cfs (Anon., 1969). The Nickajack Dam site lies within a "... narrow zone of interbedded shale and limestone of the Rockwood formation" (Anon., 1963). Bedrock at the site is overlain by an average 30 ft. of alluvia. The riverbed is rock for the most part. "The strike is N 40°E, essentially at right angles to the river, and the dip is 2° to 3° upstream." The Rockwood is the principal geologic formation on which the dam is situated. The Rockwood formation of Silurian age is about 120 ft. thick at the dam site. The Sequatchie formation, underlying the Rockwood, is approximately 235 ft. thick (Anon., 1963).

The No. 1 coffer dam at the Nickajack Dam construction site was dewatered on 16 June 1965 (Fig. 1). Since the entire cross section of the river at the site was dewatered, a unique opportunity for collecting mussels was provided. The normal streamflow was diverted to an artificial channel around the construction site; this made it possible to collect specimens from the entire riverbed (about 600 ft. wide, 1100 ft. long) within the coffer dam by simply walking over the area. Figs. 2-7 show the configuration of the riverbed.

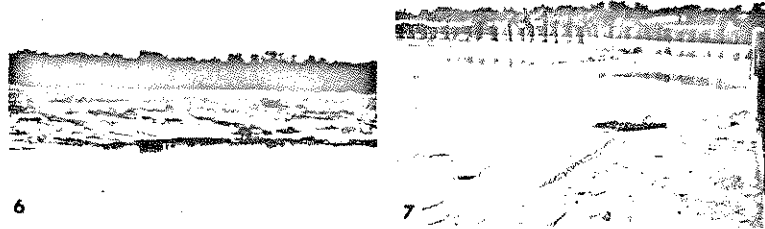
Seventeen species of mussels and the Asiatic clam (*Corbicula manilensis*) were collected from the site. Seventy-six percent (13 of 17) of the mussel species collected were those reported by Ortman (1925) in

TABLE 1. Mussel records for the Nickajack Dam site, Tennessee River Mile (TRM) 424.7, 16 June 1965, Scruggs (1960 TRM 384, and Ortman (1925), Bridgeport, Alabama, near TRM 415. Numerals refer to numbers of specimens collected; "X" indicates that the particular species was present.

Species	Year of collection			
	1965		1960	1925
	Live	Shells only		
<i>Fusconaia ebena</i>			X	
<i>Megalanaia gigantea</i>	10	5	X	
<i>Amblyma (costata) plicata</i>		7	X	
<i>Quadrula pustulosa</i>	13	2	X	X
<i>Q. fragosa</i>			X	
<i>Q. metanevra</i>	5	3	X	X
<i>Q. cylindrica</i>				X
<i>Tritogonia verrucosa</i>		2	X	X
<i>Cyclonaias tuberculata</i>		2	X	X
<i>granifera</i>				
<i>Plethobasus cooperianus</i>			X	X
<i>P. cyphus</i>			X	
<i>Lexingtonia dollabelloides</i>				X
<i>Pleurobema cordatum</i>	12	2	X	X
<i>P. cordatum plenum</i>				X
<i>P. cordatum pyramidatum</i>				X
<i>Elliptio crassidens</i>		5	X	X
<i>E. dilatatus</i>	3			X
<i>Ptychobranthus fasciolaris</i>				X
<i>Obliquaria reflexa</i>		6	X	X
<i>Dromus dromas</i>				X
<i>Cyprogenia trrorata</i>		1		X
<i>Obovaria olivaria</i>				X
<i>O. retusa</i>				X
<i>Actionanaias carinata gibba</i>				X
<i>Plagiola lineolata</i>	1	7	X	X
<i>Truncilla donaciformis</i>			X	
<i>Leptodea fragilis</i>	9			X
<i>Proptera alata</i>	13	1		
<i>Ligumia recta latissima</i>	1	4		X
<i>Lampsilis ovata</i>	1	2		X
<i>L. orbiculata</i>	3	1		
<i>L. fasciola</i>				X
<i>Dynamia triquetra</i>				X
<i>Corbicula manilensis</i>	12			



FIGS. 2-4  
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FIGS. 6 and 7. Nickajack Dam construction site. FIG. 6. View of undulating riverbed configuration. FIG. 7. Looking north from the upstream coffer dam. Note abandoned mussel boat in foreground and footprints in erosion sediment. Photographs by author.

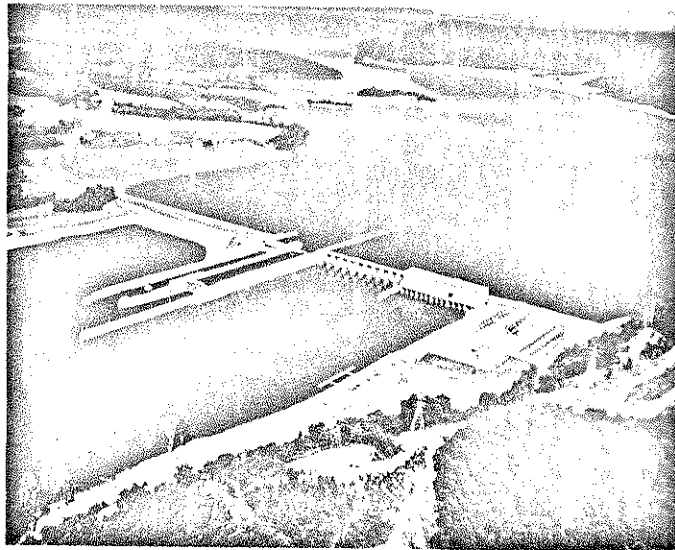


FIG. 8. View of the completed Nickajack Dam and Nickajack Reservoir. TVA photograph.

the area of Tennessee River Mile (TRM) 415, Table 1. These were included in Isom (1969) without discussion. The author's data in Table 1 are the result of a random collection that, it is hoped, includes all the species at the collection site, but that represents only a minor portion of the total number of specimens present. Scruggs (1960) reported 15 species of mussels from TRM 384, which is well downstream from the Nickajack Dam site, but still within the Guntersville Reservoir complex of which the Nickajack Dam site was a part before the dam was constructed.

Species noted in Table 1 constitute all of the records that could be found relating to the recent mussel fauna immediately below Walden Gorge. There may be some information on mussels from excavations at Russell Cave National Monument near Bridgeport, Alabama, that would give further insight into the historical fauna of this region.

It is conjectured that a number of the mussels reported by Scruggs (1960) and the author will establish viable populations in the reach below the completed Nickajack Dam (Fig. 8). There are numerous small populations in Guntersville Reservoir downstream of Nickajack Dam that are the basis of this conjecture (Isom, 1969; pers. observ.). There are also numerous species of mussels below Guntersville Dam which may be of value in natural establishment of these species by way of migration of their fish hosts.

LITERATURE CITED. — Anon. 1963. The Nickajack project on the Tennessee River. Report No. 44-100. Tennessee Valley Authority, Knoxville, Tennessee, 64 p, 14 exhibits. — Anon. 1969. Supplement No. H1 to engineering data - TVA water control projects. Tech. Monogr. 55, Vol. 1. Tennessee Valley Authority, Knoxville, Tennessee. Numerous pages. Not numbered consecutively. — ISOM, B. G. 1969. The mussel resource of the Tennessee River. *Malacologia*, 7(2-3): 397-425. — ORTMANN, A. E. 1925. The naiad fauna of the Tennessee River system below Walden Gorge. *Amer. Midl. Natur.*, 9(8): 321-372. — SCRUGGS, G. D., Jr. 1960. Status of fresh-water mussel stocks in the Tennessee River. *U. S. Fish & Wildl. Serv. Spec. Rep.*, Fisheries No. 370: 1-41.

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