AMERICAN MALACOLOGICAL UNION
THIRTIETH ANNUAL MEETING

New Orleans, Louisiana — July 21–24, 1964

When at the 1963 meeting it was announced that the next annual AMU meeting would be held in New Orleans, doubt and anticipation held equal sway. "Nobody goes to New Orleans in the summertime . . . hot . . . mosquitoes . . . too far away . . . hot . . . hot . . . hot!"

But once their invitation had been accepted the Doctors Dundee—Dolores and Harold—paid the doubters no never mind, as they say in the South, instead went right to work to plan a meeting packed with unusual features. Upon reading the list of scheduled highlights interspersed among scientific sessions, one wondered how four days might possibly contain them all. But careful and detailed planning paid off as one event dovetailed into the next, and one hundred (give or take a few) AMU members and their guests enjoyed an annual meeting that will be remembered and discussed for a long time to come.

Headquarters was the Sheraton-Charles Hotel, handy both to busy Canal Street and its stores and to the French Quarter. All sessions were held in well-equipped, air-conditioned meeting rooms on the hotel balcony and the lobby was ample and suitable for chatting. Indeed, those addicted more to comfort than to sightseeing or shopping had no need to leave the hotel save for two evening excursions to partake of the annual banquet and to enjoy the river-boat excursion.

On Tuesday morning Dr. Harold Dundee set up his efficient registration facilities on the balcony overlooking the lounge and soon the familiar badges were in evidence everywhere. Each person registering was given a folder containing sightseeing guides of New Orleans and the French Quarter, a mimeographed list of the mollusks of the area, and a program of the meeting itself. This last was adorned with a cut of *Io fluvialis* Say which has become the recognized symbol of the AMU.

Registration over, visiting was the order of the day until 1:00 P.M. when President John Q. Burch pounded the official gavel to signal formal opening of the thirtieth annual meeting.

He introduced Dr. Dolores Dundee, "Whose guests we all are and who has worked long and hard to bring us all together under such comfortable circumstances."

Dr. Dundee—who is Dee to one and all—expressed warm greetings to the assembled delegates, explaining that all were the guests not only of her husband and herself but of her school, Louisiana State University in New Orleans. "We so wanted you to come, and we're not lacking in southern hospitality, but since we do have a transportation problem it seemed wiser to use the hotel as headquarters."

She in turn introduced Dr. Homer L. Hitt, Chancellor of L.S.U. in New Orleans.

Chancellor Hitt startled his audience by remarking that he was sorry everyone listening was not older, "For a few years hence you would be holding this meeting on a beautiful lake front instead of downtown. Right now we would be unable to convince you that we're constructing the South's most beautiful campus, for what's beautiful about a bulldozer? But for now, between sessions you must seek relaxation on Bourbon Street instead of collecting snails around Lake Pontchartrain."

He sketched briefly the rapid growth of his school whose facilities include an outstanding science building with a research center yet in the planning stage. "This building you'll have to see on your next visit. For now, enjoy your stay in America's most interesting city."

In thanking Dr. Hitt, President Burch remarked that every schoolboy knows, or should know, the colorful history of New Orleans. "Many of us recall the city in what we like to think of as the good old days; that was when I knew it best, some fifty years ago."

He then introduced the first paper:

OBSERVATIONS ON ADVERSE RELATIONS BETWEEN THE HYDROID, *HYDRACTINIA ECHINATA*, AND CERTAIN MOLLUSKS. Arthur S. Merrill, U. S. Bureau of Commercial Fisheries and Biological Laboratory, Oxford, Maryland.

(Abstract)

***Hydractinia echinata* is a polymorphic hydroid that grows by increasing the number of individuals in a colony. The hydroid lives frequently as an epizoon on the external shell surface of the sea scallop, *Placopecten magellanicus*. When a colony reaches the shell edge of the scallop it expands over and around the shell margin and attempts to establish on the internal shell surface. This intrusion interferes with normal mantle activity of the host scallop, which in turn affects growth and causes shell malformation.**

Observations indicate that gastropods, too, are not immune to the effects of direct association with *Hydractinia echinata*. Several species (*Nassarius trivittatus*, *Lunatia heros*, *Buccinum undatum*, and *Epitonium greenlandicum*) were observed to have reacted to the presence of the advancing zooids of a colony by enlarging the area of their apertures. The apertures often become badly deformed, extremely enlarged, and globose.

Thus, *Hydractinia echinata*, which normally uses a shell simply as a substrate, is capable of becoming a harmful epizoon. This type of relationship in which one of the associates is inhibited while the other is not affected is best described by the term *amensal* as defined by Eugene Odum (1953, *Fundamentals of Ecology*, W. B. Saunders Company, Philadelphia).

(Slides of infected sea scallops and various Gastropoda accompanied this paper.)

President Burch: "In California we have many hydroids, one most common on *Donax gouldi*, for instance."

BEHAVIOR OF UNIONID GLOCHIDIA.[1] William H. Heard and Sherman S. Hendrix, Florida State University, Tallahassee, Florida, and Gettysburg College, Gettysburg, Pennsylvania. Read by Dr. Heard.

[1] This investigation was supported (in part) by grant 26-036 from the Florida State University Research Council, 1963–1964.

(Abstract)

Lefevre and Curtis (1912, *Bull. Bur. Fish.*, 30) investigated the reactions of glochidia of several species of unionid mussels to a variety of fishes' blood, chemical reagents, and physical stimuli. They reported (1) that hookless glochidia (subfamilies Unioninae and Lampsilinae) are typically gill parasites of fishes, and that their attachment is a chemical response, and (2) that hooked glochidia (subfamily Anodontinae) are generally fin parasites whose attachment has a physical (i.e., tactile) basis.

Arey (1921, *J. Exp. Zool.*, 33), however, after a more extensive study, concluded that responses to tactile stimuli are exhibited by glochidia in all three subfamilies, and that this behavior alone is adequate to insure attachment to the host fish. Furthermore, while certain chemicals may stimulate glochidial closure, varied responses occur, and these are related to the concentration of the reagent utilized.

Our observations on the glochidia of *Carunculina paula*, *C. villosa*, *Lampsilis anodontoides floridensis*, *L. claibornensis*, *L. excavatus*, *Villosa lienosa*, and *V. vibex* (all in Lampsilinae) support Arey's conclusions. Blood from 24 species of fishes representing 10 families in 7 orders evoked a variety of glochidial responses, presumably caused by different concentrations of chemicals in the blood: from increased flapping of the valves to immediate and permanent closure. Inorganic compounds as well as organic compounds representing products of digestion were also utilized. Among the organic reagents used, the 20 natural L amino acids (1×10^{-1} M concentration) which make up protiens provided the most interesting results: all but the three basic amino acids (arginine, histidine, and lysine) stimulated immediate closure. Glochidia of *Lampsilis anodontoides floridensis* and *L. claibornensis* were exposed to varied concentrations (1×10^{1}, 1×10^{-1}, 1×10^{-2}, 1×10^{-3}, 1×10^{-4}, and 1×10^{-5} M) of the 20 amino acids, and stronger reactions were observed at greater concentrations. *Lampsilis anodontoides floridensis* exhibited an all-or-none response, while *L. claibornensis* showed a more graduated behavior; and the former displayed a stronger response than did the latter to the same lower concentrations. Both species responded only weakly to 1×10^{1} concentrations of the basic amino acids and not at all to lesser concentrations.

While physical stimuli may bring about attachment, the responses to chemical stimuli may serve to insure continued attachment until the glochidium is overgrown by host tissue to form the cyst. Free amino acids in the fish blood and in the lysed host tissues probably serve the additional function of providing a sufficiently quantitative source of component units for protein synthesis during the metamorphosis from the parasitic larval stage to the free-living juvenile stage in the life history of the mussel.

(This paper was illustrated by projected maps of the drainage systems under discussion together with their distribution of mussels, then charts of response to blood of fishes, human blood, and that of a rooster by six species of mussels.)

Van der Schalie: "Has Max Ellis come up with anything in his studies along these lines?" Heard: "No, but I plan to borrow his knowledge in my own later studies." Donald Moore: "Dall in 1889 said that some deep-sea

mollusks produce glochidia." Heard: "I read something of that, but it seems not to have been substantiated."

THE FOREIGN FRESHWATER SNAILS NOW ESTABLISHED IN PUERTO RICO.[1] Harold W. Harry, Texas A. and M. Marine Laboratory, Galveston, Texas, and Rice University, Houston, Texas.

(Abstract)

Foreign Mollusca are those introduced by human agency into an area remote from their native territory. The most certain criterion for recognizing foreign snails or bivalves is (1) detailed knowledge of the circumstances of introduction. Should this not be available, several of the following criteria taken together are useful in distinguishing exogenous species: (2) the time of importation can be reasonably estimated from previous familiarity with the fauna of the area; (3) the suspected import may have no close relatives in the area where it is introduced; (4) the species tends to remain in habitats much affected by human activity; (5) the import remains localized in the new area, and has no natural vagility to invade new habitats there; (6) the species is known to be a foreign snail in other areas; (7) the species may have enormous population densities in their new home, exceeding the population densities of native snails.

By the above criteria, six of the 27 freshwater Mollusca of Puerto Rico are exogenous. Two of them are hosts of trematodes of medical importance. The three foreign prosobranchs are the only members of their families on the island, and they are apparently absent over much of the area between Puerto Rico and their indigenous territory, even though seemingly suitable habitats occur in the intervening area. They have enormous population densities in Puerto Rico, and have been deliberately spread about the island in unsuccessful attempts to control *Taphius glabratus* Say, the indigenous snail host of *Schistosoma mansoni*.

The three exogenous pulmonates belong to families and even genera indigenous to the island. They do not produce excessively abundant populations. The exact circumstances of their introduction are unknown, but the approximate time of introduction of two of them can be estimated by comparing the eight faunal lists of the freshwater Mollusca of Puerto Rico published between 1854 and 1964. In the following list, the numbers in parentheses by each snail indicate the above criteria which indicate that it is exogenous.

***Thiara granifera* Lamarck (2, 3, 5, 6, 7) is reputedly the host of the lung fluke, *Peragonimus westermani*, but this worm has not been reported from Puerto Rico. The frequent statement in the literature that this snail lacks males and that the eggs develop by parthenogenesis is erroneous. The sex ratio is about one male per five females in Puerto Rico.**

***Marisa cornuarietis* Lamarck (2, 3, 4, 5, 6, 7) has been much studied in attempted biological control of the schistosome vector snail. However, no studies have been made on the ecology of *Taphius glabratus*, *M. cornuarietis*, and schistosomiasis in northern South America, in the area where the natural ranges of the two snails overlap, and Manson's schistosomiasis is present.**

***Pomacea cumingii* King (1, 4, 5, 7) is a common species in aquaria hobby shops, but it has not been recorded as a foreign snail from anywhere but Puerto Rico.**

[1] Supported in part by NSF Grant GB 820.