

profunda (Say), and *Triodopsis multilineata* (Say) occasionally exhibit a transitory, dome-like swelling between the dorsal tentacles. This phenomenon, which appears most frequently during periods of increased mating activity in the terraria, has been observed only in adults—usually in animals with swollen and prominent genital areas. Although sometimes observed immediately prior to and even (in *T. multilineata*) during courtship maneuvers, the swelling is most prominently displayed by animals that sit in solitude and remain almost motionless for considerable periods. All observations point to the conclusion that this display usually precedes sexual encounter and courtship.

Of possible explanations, the simplest is that the swelling is a mechanical result of internal pressures coincident with sexual arousal and that it has no other particular significance. A more attractive possibility is that the swelling is a specialized emitter or receptor site involved in chemical attraction or detection of potential mates.

(Several slides of living snails exhibiting the abnormality were shown.)

Morrison: "I don't think you can consider this a chemical receptor. It seems more likely to be some generic abnormality."

FRESHWATER MOLLUSKS OF THE HUDSON BAY WATERSHED,
DISTRIBUTION PATTERNS AND DETERMINANT INFLUENCES.
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(Abstract)

Just north of the Mississippi-Missouri and St. Lawrence basins lies a vast area of partially interconnected river systems, the Hudson Bay Watershed. About 100 species and subspecies of freshwater mollusks occur here, and all major North American families except Pleuroceridae are represented.

Based on distribution, three general groups can be distinguished: (I) endemic elements (about 10% of the total); (II) holarctic elements (about 15%); and (III) southern elements (about 75%). Group I contains several taxa which appear to have evolved since the Pleistocene (e.g., *Valvata sincera ontariensis* and *Stagnicola arctica*). Group II includes species which penetrate farther into the Canadian arctic than any others, i.e., to Baffin Island and Victoria Island. Members of this group include *Lymnaea stagnalis*, *Stagnicola palustris*, several sphaeriids, etc. Group III is composed principally of species which reach their northern limits within this region, and it is sometimes possible to correlate these limits with biological and geological factors and with isotherms.

In the Unionidae, for example, several species apparently invaded the Hudson Bay Watershed during postglacial confluence from the Mississippi-Missouri Basin by way of the Red River. Some of these (*Fusconaia flava*, *Quadrula quadrula*, *Crenodonta plicata*, *Lasmigona costata*, and *Proptera alata*) have not penetrated beyond southern Manitoba; others (*Ligumia recta*, *Lampsilis ovata ventricosa*, and *Strophitus undulatus*) have spread into northern and western Manitoba or to eastern Saskatchewan; and one (*Lasmigona complanata*) has spread even through central Alberta to the Lake Athabasca drainage. All range expansions in this group have been northward and west-

ward, never eastward into the soft-water habitats of the Precambrian Shield. The varying degrees of success in penetrating colder regions may be related to threshold spawning requirements. In only two cases (*Ligumia recta* and *Strophitus undulatus*) does absence of the known fish host appear to be limiting.

Other Unionidae have used alternate invasion routes. *Elliptio complanatus* has penetrated the Hudson Bay Watershed only from the St. Lawrence System and is confined to that part of Ontario and Quebec east of Lake Nipigon and south of James Bay. It is uncommon or rare in this region, however, and competition with the abundant and nearly ubiquitous *Lampsilis radiata siliquoidea* may be a limiting factor. Two other species, *Lasmigona compressa* and *Anodontoides ferussacianus*, appear to have used dual invasion routes, one from Lake Superior through Lake Nipigon and Long Lac and one from the Mississippi-Missouri Basin through the Red River, but the distribution of neither species in the Hudson Bay Watershed appears to be correlated with bedrock geology or with temperature.

Anodonta grandis and *L. radiata siliquoidea* may have utilized multiple invasion routes. Both species occur throughout the entire boreal forest region even including the Mackenzie River north of Great Slave Lake. Summer water temperature data are desirable but unavailable. The northern limits of both species fall within the zone bounded by the 55° and 60°F. July average daily temperature isotherms, however, and are probably indirectly related to these average values.

(A projected map of Canada, of the geology of the region and slides of species followed by distribution maps illustrated Dr. Clarke's paper.)

President Burch: "This paper represents a great amount of painstaking work!"

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With this, opening day's papers were brought to an end and the three hours before the scheduled evening assembly afforded the first opportunity to locate and sample the cuisine of one or another of the fine restaurants so plentiful in New Orleans. In this, home of the po' boy sandwich and where grits and red-eye gravy are as staple as bread and butter, the Northerners were intrigued by the variety of unfamiliar dishes. Perhaps most enjoyed was the abundance of fish and crustacea, never better than here, short hours away from their watery home.

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At eight o'clock began an innovation which had been billed as Shell Club Night. Each of the thirty-two local shell clubs affiliated with the AMU had been invited to participate by sending delegates and an exhibit, a report of club activities, or other offerings of an instructive or entertaining nature.

Mr. and Mrs. Harvey Meyer acted as joint chairmen of the evening, doing a masterful job of correlating the varied material into a smooth-running and interesting program.

SHELL CLUB NIGHT

Spokesmen for the North Carolina Shell Club were Carl Withrow and James Wadsworth; it covers, said they, probably the largest geographical area of any club. Three meetings are held on the coast each year, the fourth inland.

Mrs. Betty Witt reported that the Philadelphia Club now has 225 members. The New York Shell Club, said Marian Schroth, held a shell auction in April and \$500 was donated from the proceeds to the American Museum of Natural History to aid in financing a display of New York area shells.

The Gulf Coast Shell Club of Beaumont, Texas had no formal presentation, but two members in attendance were introduced. They, together with other club members, had prepared place favors for the annual dinner but they had unaccountably become lost in the mail.

The Connecticut Shell Club, the Connecticut Valley Shell Club, and the Rochester (N. Y.) Shell and Shore Club sent in written reports.

Mrs. Dorna Paxton Coley reported on behalf of the Pacific Northwest Shell Club which is now incorporated; they hope, said they, to invite the AMU to Seattle for the 1966 annual meeting.

Representing the National Capitol Shell Club, Dr. Tom Burch reported that proceeds of their first shell auction have been set aside to establish a scholarship fund to be awarded annually. (Further details on page 58.)

Myra Taylor of the San Antonio Shell Club noted that being 150 miles inland, little marine collecting is done by club members. However, she offered to introduce anyone traveling in the vicinity of San Antonio to the 15 varieties of mollusks in the Guadalupe River, or conduct them to several nearby fossil beds.

The Jacksonville Shell Club, said Mrs. Liz Eubanks, has assembled a reference collection of northeast Florida shells and put together exhibits for the Florida State Chamber of Commerce and the Children's Museum.

One of the newer clubs (two years) is the Broward Shell Club which holds meetings in South Pompano Beach, Florida; Mrs. Therese Marsh reported briefly on club activities.

Two other Florida clubs had mailed reports, the South Florida Shell Club of Miami and the Palm Beach County Shell Club of West Palm Beach; these were read by Mr. James Wadsworth.

William Reader reported for his St. Petersburg Shell Club that over the past year \$1,500 has been donated to Florida Presbyterian College to furnish a science classroom, this money was realized from annual shell shows.

The Sanibel-Captiva Shell Club, reported Mrs. Harvey Meyer, is now especially interested in conservation; 24,000 booklets have been distributed to tourists in which collecting and cleaning tips are interspersed with injunctions not to be a shell hog! Another club activity is the annual shell count or census.

The Conchological Club of Southern California had furnished two displays which were arranged on long tables. One of these was the work of Mrs. Twila Bratcher, a project whereby the blind are provided means of appreciation of the beauty of form and texture of shells. Shells were in compartmented boxes, each identified by a Braille label. The other was an impressive showing of the publications of club members.

Flanking these displays were two others, one made by the Boy's Club of Syracuse, N. Y. and furnished by Mr. Adlai B. Wheel, well known for his efforts in interesting children in the world of nature. The other was an assortment of beach shells from the Virgin Islands, brought by Mr. G. Usticke, who generously offered them to all interested "collectors." Needless to say, his offer was eagerly accepted.