

The Sanibel-Captiva Shell Club, Inc.

# The Junonia

October 2011

## Get ready, set, go!

A great Sanibel-Captiva Shell Club year is about to begin. The groundwork has been laid, and we're on our way to celebrating the 75<sup>th</sup> Sanibel Shell Show. This diamond jubilee shell show will be the high point of the decade for the club.

The island's focus on the 75<sup>th</sup> Shell Show has already begun. The theme of the 4<sup>th</sup> of July parade was "Shellabration," and the grand marshals for the parade were Anne Joffe, representing the Shell Club, and Ann Arnoff, representing the Sanibel Community Association. Each week, the *Island Sun* has an article relating to the coming 75<sup>th</sup> shell show.

The "buzz" is that many people have already planned their exhibits and have been eagerly awaiting the release of the shell show application forms. The application form can now be downloaded from the Shell Club's web site [sanibelcaptivashellclub.com](http://sanibelcaptivashellclub.com).

The year is going to be stimulating, exciting and maybe a little exhausting. This is where you come in. If everyone volunteers to help a little, we can all have time to enjoy this momentous event. In the coming newsletters, we will tell you about the events that will lead up to the Shell Show and how you can help. We will set up for the show on Sunday, February 26<sup>th</sup>. Exhibitors will bring their entries on Tuesday the 28<sup>th</sup>, and the show will be open to the public Thursday through Saturday.

One thing that you can do right now is to start collecting beach shells that can be used in the little bags that we give to people attending the show. This gives you an opportunity to go to the beach and do what shell collectors like to do most – pick up shells. Or, if you have a stash of medium sized shells that are taking up space in your garage, why not bring them to the next Shell Club meeting. They do not need to be local shells.

## Our regular meeting day has been changed

During the past year, holding the Shell Club meeting on the 4<sup>th</sup> Sunday of the month resulted in conflicts and we had to change the date of more than one meeting. For this reason, Board of Directors has decided to change the regular meeting day from the 4<sup>th</sup> Sunday to the 3<sup>rd</sup> Sunday of the month. The exception will be the date of the Christmas Party. It will be announced next month.

### October Meeting

**Where:** The Bailey-Matthews Shell Museum

**When:** 2:00 PM, October 16

**Program:** "Cowries"

**Speaker:** José Leal, Ph.D.

## Dr. Leal to speak at the October meeting.

Traditionally, José Leal, Ph.D. Director of The Bailey-Matthews Shell Museum's, is the first Shell Club speaker of the year. Because the museum unveiled its newest exhibit on September 3<sup>rd</sup>, the title of Dr. Leal's presentation will be "Cowries."

Club members will be invited to view the exhibit after the meeting. The exhibit includes dozens of cowries, videos and artifacts, and also text detailing the biology, classification, collectability, diversity, cultural history and impact of the mollusk. Colorful clips of live cowries allow you to see them in action underwater in the Marshall Islands.

Rich and Jean, Rompala, part-time Sanibel residents, funded the exhibit. Jean is an education docent at the museum.

A dedication of the cowry exhibit will be held on November 8<sup>th</sup> at 6:00 PM. Shell club members are invited to attend.

## Minutes of the March 2011 meeting

*By Clair Beckman  
Acting Secretary*

President Anne Joffe called the meeting to order at 2pm.

The minutes of the February meeting as previously distributed in the *Junonia* were approved.

Treasurer Clair Beckmann presented the treasurer's report. It was approved and is on file. A copy is available to members upon request.

Anne Joffe reported on Shellebration Week for the 75<sup>th</sup> Show and announced two new categories, one in the Scientific Division and one in the Artistic Division. These categories, "Remembering 75 Great Years" will feature the use of 75 shells. Scientific exhibits must contain no more and no less than 75 shells. Artistic exhibits must be created with exactly 75 shells.

Anne thanked Kerry Nugent and Phyllis Sharp for getting the website up to date.

A trip to Chub Cay June 9-16<sup>th</sup> was announced by Anne.

Anne asked for volunteers to help at the Edible Mollusk Festival and anyone willing to eat as well. Linda Edinburgh modeled the Lily necklace being raffled at the event and sold raffle tickets.

Dick Willis indicated we are up to 166 members. He then read a lovely note from an 87-year-old woman whose "Bucket List" included entering the Sanibel Shell Show. Dick had helped her with the process and she entered seven exhibits. She won a trophy and ribbons for each exhibit.

The "Show & Tell" segment of the meeting was enjoyed by everyone. Irene Longley presented the story of how she found an amazing epitonium at Calvert Cliffs. Jeff Oths presented his turbo collection including various beautiful objects made from the turbo shells. Anne Joffe shared a story about her 29 green turbos from Tahiti.

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Vice President Jeff Oths introduced Jim Wedge from Sarasota who presented a program on the marine life of Palau.

Door prizes donated by Wedge were awarded and refreshments

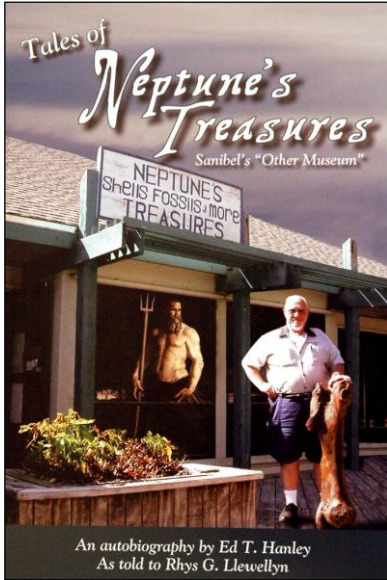
## Long time Sanibel shell collector and entrepreneur authors book

By Joyce Matthys

Ed Hanley was an adventurer, scuba diver, shell collector, treasure hunter, relic and fossil hunter. As the owner/operator of Sanibel's most unique store Neptune's Treasures, Ed entertained his customers for twenty-five years with tales of his adventures.

When Ed's health declined, his close friend, Rhys Llewellyn, offered to write his autobiography for him. After recording and assembling many hours of Ed's recollections, the book was released this July. In this book, Ed shares his true stories and experiences from over a half-century of collecting beautiful rare shells and artifacts in *Tales of Neptune's Treasures* – Sanibel's "Other Museum".

For many years, Ed wrote the weekly column, *Let's Shell Sanibel* for the *Sanibel-Captiva Shopper's Guide*. The Appendix includes a complete set of these illustrated columns.



This 384 page softbound book contains 80 photographs. It can be purchased for \$19.95 plus tax, shipping and handling. For more information contact Rhys Llewellyn at [gatorbytes1@aol.com](mailto:gatorbytes1@aol.com).

## Looking ahead

Gary Schmelz, Ph.D. will lead a fossil field trip on Saturday, March 24<sup>th</sup>. This will be a joint venture of the Sanibel-Captiva Shell Club and the Bailey-Matthews Shell Museum. For more information contact Diane Thomas at the museum (239) 395-2233.

## Don't forget "Show & Tell" and your shelling stories



Do you have an interesting shell collecting story? Why not share it with us at the October meeting? Where did you get what you consider your most unusual shell? Bring it along to the meeting and tell us about it. Big shells – little shells, we love them all, and we'd like to hear your story about them! These shelling tales make our meetings fun and interesting.

**Question: What does a scallop do on his birthday?**

**Answer: He "shellbrates"!**

## Nanotechnology inspired by mussels and seashells

by Michael Berger

Nanowerk.com

Photographs by Joyce Matthys

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"Nanotechnology Inspired by Mussels and Seashells" posted April 3, 2007, and "Designer Molecules Open New Manufacturing Route for Materials Scientists" posted August 8, 2011, were written by Michael Berger for Nanowerk. Portions of these articles are found below, along with, "Let's Start with the Basics" from the Nanowerk Web site. The photographs were taken by Joyce Matthys.

### How long is a nanometer?

Nano comes from the Greek word for *dwarf*. The prefix nano means a factor of one billionth ( $10^{-9}$ ) and can be applied, e.g., to time (nanosecond), volume (nanoliter), weight (nanogram) or length (nanometer or nm). In its popular use *nano* refers to length, and the nanoscale usually refers to a length from the atomic level of around 0.1 nm up to 100 nm. Nanostructures or nanomaterials are forms of matter at the nanoscale.

To give you an idea how small this is, if you line up 7 oxygen atoms or 3-4 water molecules, you'll get about one nanometer. But that's hard to imagine. How about this: a red blood cell is approximately 7,000 nm wide. Or, to use a beaten-to-death comparison: a single hair from your head is about 50,000 – 100,000 nm thick. Want more?

- Your fingernails grow about one nanometer per second;
- A sphere with a diameter of one nm compares to a soccer ball as the soccer ball compares to the Earth;
- In the time it takes to pick a razor and raise it to his face, a man's beard will have grown one nanometer;
- 8 to 10 atoms, depending on the element, in a row span one nanometer.

It is really, really hard to imagine things so small, no matter how convoluted the example; like this (very last) one: Precisely positioning a one nanometer sized structure inside a line that is one meter long is analogous to being able to exactly position a peppercorn in the distance between New York and Miami.

### Uses for nanotechnology

Super-tough materials with exceptional mechanical properties are in critical need for applications under extreme conditions such as jet engines, power turbines, catalytic heat exchangers, military armors, airplanes, and spacecraft. Researchers involved in improving man-made composite materials are trying to understand how some of the amazing high-performance materials found in nature can be copied or even improved upon

Nature has evolved complex bottom-up methods for fabricating ordered nanostructured materials that often have extraordinary mechanical strength and toughness. One of the best examples is nacre (mother-of-pearl), the pearly internal layer of many mollusk shells. It has evolved through millions of years to a level of optimization currently achieved in very few engineered composites.



**Nautilus with outer layer of shell removed**

Mussels secrete remarkable protein-based adhesive materials (mussel adhesive proteins – MAPs) for adherence to the substrates upon which they reside. The protein adhesives are secreted as fluids that undergo a hardening reaction leading to the formation of a solid adhesive plaque – think of cement – with which the mussel bonds to a variety of substrates such as minerals, metal surfaces, and wood. One of the unique structural features of MAP is the presence of DOPA, an amino acid that is believed to be responsible for both adhesive and crosslinking characteristics of MAPs.



**Mussel byssal threads can be seen attached to very small shell fragments.**

Kotov, an Associate Professor in Chemical Engineering at the University of Michigan collaborated with the research group of Philip B. Messersmith at Northwestern University who are actively developing synthetic polymers that mimic the composition and properties of adhesive proteins found in nature such as DOPA.

In a novel approach, scientists have prepared a high-performing nanocomposite material that takes advantage of two different exceptional natural materials - layered nacre and the marine adhesive of mussels. The resulting nanostructured composite film exhibits high strength exceeding that of even nacre.

"The main problem in making nanocomposite materials is how the separate components can be interfaced without losing the good properties of each component" Dr. Päivi Laaksonen, a researcher in the Nanobiotechnology group at the VTT Technical Research Centre of Finland, tells Nanowerk. "Often chemical incompatibility prevents efficient transfer of impacts between the materials, which leads to easy fracturing."

Laaksonen is first author of a paper in the July 22, 2011 online edition of *Angewandte Chemie International Edition* ("Genetic Engineering of Biomimetic Nanocomposites: Diblock Proteins, Graphene, and Nanofibrillated Cellulose"), where she and a team of scientist from VTT, Aalto University and the RWTH Aachen

describe how they were able to significantly strengthen a nanocellulose paper by gluing flakes of graphene to it.

The researchers were inspired by recent findings on the structures and functions proteins found in mollusc shells ("An Acidic Matrix Protein, Pif, Is a Key Macromolecule for Nacre Formation"): It was found out that there is a protein that is able to bind both to the mineral platelets and the organic matrix of nacre, although the exact role of this protein in the mechanical properties of nacre has not been verified.

"Since we had the possibility to create analogous proteins, we could choose the materials we wanted to combine and simply glued these together with the proteins," says Laaksonen. "This design resulted in our nanocomposite with enhanced mechanical properties."

In this work, genetic engineering was employed in creating biomolecules that could glue together materials with different properties. Specifically, a genetically engineered protein showed the ability to connect graphene (stiff) and cellulose (strong) so that it self-assembles at the interfaces.

**Note** - To read the above articles in their entirety, go to: <http://www.nanowerk.com/spotlight/spotid=22330.php> and <http://www.nanowerk.com/spotlight/spotid=1723.php>

### **Ingested microscopic plastic translocates to the circulatory system of the mussel, *Mytilus edulis***

by Mark A Browne, Awantha Dissanayake, Tamara S Galloway, David M Lowe, Richard C Thompson

Plastics debris is accumulating in the environment and is fragmenting into smaller pieces; as it does, the potential for ingestion by animals increases. The consequences of macroplastic debris for wildlife are well documented, however the impacts of microplastic (1 mm) are poorly understood.

The mussel, *Mytilus edulis*, was used to investigate ingestion, translocation, and accumulation of this debris. Initial experiments showed that upon ingestion, microplastic accumulated in the gut. Mussels were subsequently exposed to treatments containing seawater and microplastic (3.0 or 9.6 microns). After transfer to clean conditions, microplastic was tracked in the hemolymph. Particles translocated from the gut to the circulatory system within 3 days and persisted for over 48 days. Abundance of microplastic was greatest after 12 days and declined thereafter.

Smaller particles were more abundant than larger particles and our data indicate as plastic fragments into smaller particles, the potential for accumulation in the tissues of an organism increases. The short-term pulse exposure used here did not result in significant biological effects. However, plastics are exceedingly durable and so further work using a wider range of organisms, polymers, and periods of exposure will be required to establish the biological consequences of this debris.

Browne, M. A., Dissanayake, A., Galloway, T. S., Lowe, D. M., & Thompson, R. C. (2008). Ingested microscopic plastic translocates to the circulatory system of the mussel, *Mytilus edulis* (L). *Environmental Science Technology*, 42(13), 5026-5031. ACS Publications. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18678044>

"The world is my oyster except for months with an "R" in them"  
- Firesign Theatre

## Celebrating the power of ice

*Quebec's Garden of the Glaciers full of unique features*

by Diane Slawych, QMI Agency  
First Posted Wednesday, June 8, 2011

BAIE-COMEAU, QUE. - The roads in Baie-Comeau may not be paved with gold but, not so long ago, some of them were constructed using material that is almost as precious -- at least to geologists.

Ancient seashells from the last Ice Age exist in large quantities in a valley 8-km from town in the heart of a boreal forest. For decades the shells, part of a massive deposit said to be unique in the world, were taken out by the truckload for use as fertilizer and road building in Baie-Comeau!

Four hundred tons were extracted in the 1940s alone. The exploitation of the shells stopped in 1952 and then resumed for a few years in every decade since, up until the 1980s. Removal of the ancient shells is now forbidden and Seashell Valley is a protected site that is open to visitors.

The shells are comprised of 35-species of mollusks -- 12 are the most common and include clams and arctic mussels. Many are broken, but plenty of intact shells can also be found.

Travelling on a gravel road into the valley, we stop at the first wall of shells. If you were driving by, you could easily mistake it for a hill of sand. On closer inspection, however, you can clearly see the shells.

Pascal Bernatchez, a geomorphology professor at L'UQAR (Universite du Quebec a Rimouski), says this is one of the most important seashell fossil formations in the world. Most seashell deposits are about 1-metre thick and contain 15% to 35% shells. This deposit is the thickest ever noted -- 15-metres high and made up of 90% shells. And to think these deposits were once even bigger.

Our guide, Christian Bouchard, says the entire shell deposit is 300-metres wide and 180-metres deep.

Nearby, a boardwalk has been installed with interpretive panels at the base of a semi-circular wall of shells. In the middle is a hill of seashells, which a few children with shovels and pails are exploring. There are areas where visitors are allowed to handle the ancient mollusks as long as they don't take them away.

Seashell Valley and several other new Baie-Comeau attractions make up the Garden of the Glaciers -- a tourism project focused on the last Ice Age -- that was started in 1994 and completed recently at a cost of \$13.4-million. It has three major components:

- **An Adrenalin Zone**, with eight ziplines and two via ferrate (protected climbing routes) along the St. Lawrence River, spots for rappelling, water activities (inflatable iceberg, trampoline), sea kayaking, hiking on 35-km of trails and camping (with a choice of tent platforms, equipped yurts or prospector's tents).

- **A Multimedia Zone** centered around the new Glacier Exploration Station has films, displays and -- the main attraction -- a multimedia show and trail that transports you to the heart of a glacier.

- **The Nature Zone**, which includes Seashell Valley; an outdoor trail called Peoples of the Ice Age with recreated dwellings like those made by North America's first inhabitants; and the Traces of the Glaciers boat tour on the St. Lawrence River.

All of the sites are within the Manicouagan region. In 2007, Manicouagan-Uapishka was designated a UNESCO World Biosphere Reserve. Covering 54,8000 sq. km, it's one of the largest biospheres on the planet and by far the largest in Canada. The UNESCO designation recognizes, among other things, the area's unique natural features.

Seashell Valley is one example. The glacial grooves are another. When large amounts of gravel and boulders travelled beneath the glacier 10,000 years ago, the abrasive power cut scratches or gouges into the bedrock.

A good way to see the grooves is from the water on the three-hour Traces of the Glaciers boat excursion. It was the Laurentide Ice Sheet, the world's largest glacier during the last Ice Age that sculpted not only these giant glacial grooves -- said to be the largest in the world -- but also the canyons, moraines, bays and fjards (different from fjords) along the shore.

There's so much to see in the region you could say the ancient seashells and glacial grooves are just the tip of the iceberg!

## Forest debris and crushed seashells filter radioactive waste from water

by Jaym Heimbach, San Francisco, CA  
4/13/11 - Science & Technology

Radioactive waste in water is a big concern after the problems in Japan, but it turns out that there is a solution for filtering the waste from water supplies. By combining forest byproducts with crushed shells, researchers at North Carolina University have created a new material for cleaning radioactive waste in water

**North Carolina State University** researchers created the new solid foam material to deal with contaminants, and found that it can absorb water extract contaminants like radioactive iodide as well as heavy metals. For smaller water supplies, it can be used like a tea bag, dipping it into the water for it to absorb the toxins. Or it can be used like a filter with water poured through it.

"As we're currently seeing in Japan, one of the major health risks posed by nuclear accidents is radioactive iodide that dissolves into drinking water. Because it is chemically identical to non-radioactive iodide, the human body cannot distinguish it - which is what allows it to accumulate in the thyroid and eventually lead to cancer," says Dr. Joel Pawlak, associate professor of forest biomaterials. "The material that we've developed binds iodide in water and traps it, which can then be properly disposed of without risk to humans or the environment." Last year we saw another research breakthrough for cleaning water that is a "tea bag" of antimicrobial fibers, which can clean water instantly. However, it can't go as far as plucking out radioactive waste. As we learn more about radioactive waste in Japan contaminating water sources, the new material from North Carolina State University could be put to the test. Currently, the Japanese government has already asked wastewater treatment facilities to [keep rainwater out of supplies, and treat for radionuclide removal](#).

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