



The Paris Museum National d'Histoire Naturelle staff freed this 45 million-year-old shell, the *Chama punctata*, from its sandstone bed with a blast cleaning process. Photograph used with permission by the museum. (Specimen MNHN A25732. The specimen was cleaned by Renaud Vacant, a lithopreparator at the museum.)

Blast Cleaning the World's Oldest Parts

by Michel Cardon

When Tilghman published the very first patents covering sand blasting in 1870, he listed many potential applications for the process from castings to etching tombstones, glass decorating to cleaning ship hulls.

Through Roger Brickwood, a good friend and work associate of many years, I now have a blast cleaning application for some of the world's oldest parts that Tilghman never considered.

In 1983, an amateur fossil hunter, William Walker, found an enormous claw, 12 inches/31 cm long, sticking out of the side of a clay pit in Surrey, England. About 70% of the Dinosaur skeleton was later recovered. It was named "Baryonix Walkerii" in his honour (Baryonix means "Heavy claw").

The fossil went to the Natural History Museum in London. When considering that the living dinosaur was about 40 feet/12 meters long, and weighed about 4 tons/3600 kg, it's easy to imagine the enormous amount of fossilized remains that the museum had to collect, protect, transport, study and prepare for display.

Vacu-Blast in Slough, United Kingdom, had sold machines to the Natural History Museum, and several other museums, while Roger Brickwood was Sales and Marketing Director at

Vacu-Blast. "We gave the museums 'educational' discounts which was quite progressive at that time," said Brickwood. "These relationships gave us great PR. When the Natural History Museum received the *Baryonix Walkerii* from Walker, they came to us and asked for help."

Tests undertaken at Vacu-Blast proved that dry blast cabinets used with fine abrasive can assist the cleaning process without damaging the specimens. As work progresses, the operator can control precisely the degree of removal before risking touching the actual part. Cracks are often found on the surface of the fossil and this brings another concern—the cleaning process must not stress the part or add to the danger of catastrophic fracture. Carefully controlled blasting achieves this result.

"Rather than make the museum staff bring us samples, we installed the machine in the museum and let the staff play with it. Their results were so good that we gave them the machine," said Brickwood.

The Paris Museum National d'Histoire Naturelle also blast cleans fossils and Philippe Richir, Lithopreparator, explained to me the difficulty of fossil preparation. "In their original sediments, fossils are found in hugely variable conservation conditions. A specimen can be large and heavy from 2 meters and 30 kg down to small, very small and thin, just a few millimetres and grams. Bigger specimens are easier to handle but bring additional challenges in their preparation. In addition, each natural site offers different working difficulties. The sediments can be limestone, clay, sand or sandstone with big differences in hardness and adhesion."

"Parts are often protected on-site by applying plaster jackets to enable the safe extraction and transport of the specimens. Then, back at the museum, careful experimentation is necessary for each specimen before selecting the best methods to remove the unwanted material. We use needles, micro tools, acid, and blasting and micro blasting cabinets. The most frequently used blasting abrasives so far are soda carbonate or bicarbonate, dolomite and crushed walnut shell, with fine to very fine mesh sizes. We try to test first with each specimen to gauge the hardness differences between the fossil and its sedimentary debris; sometimes the differences are very small and the precious fossil might be cracked or damaged if we do not understand these differences," continued Richir.

Often a painted-on rubber masking material is used to protect the surface of the fossil from the blast stream. This can be applied, stripped and replaced many times during the process. As an example of a very delicate job, Didier Merle, head of the museum's fossil shells collection conservation, shared with us the photograph of a "*Chama punctata*" shell, a tropical mollusk which lived about 45 millions years ago and was discovered in the Paris area. The very fine and delicate mollusk spines were freed from the surrounding sandstone bed by blast cleaning.

Philippe Richir adds, "We always try to combine efficiency and time-savings, but keeping the specimen in the very best possible condition is a must."

While time is money when blast cleaning today's products, to these creatures that lived millions of years ago, what is a little more time to make sure that they are treated respectfully and carefully preserved?



Michel Cardon is retired from the vacu-blast industry and resides in Paris, France. During his career, he was the manager of the vacu-blast department of his family business, Satem. He formed Matrasur which was later purchased and became Wheelabrator. Some of his career highlights include being a guest of the U.S. Capitol in 1982 and a meeting with Jacques Chirac.