

## Visiting the Underground Laboratory at The Louvre

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By Olivia Diaz

Wow! Who would have imagined there is a laboratory under the Louvre, or more exactly, under The Tuilleries. It is three stories down and is below the level of the Seine so they have to have pumps working to keep the water at bay. Thomas Calligaro, our host, joked that even at the Louvre; many of the curators are unacquainted with the existence of their laboratory.

The laboratory is called “Centre de recherche et de restauration des musées de France.” It is the only accelerator lab in the world dedicated exclusively to art and archeology. (and supporting the French cultural heritage). It is under the aegis of CNRS. Thomas explained that the work is divided into validation (i.e. is a painting real, what is its provenance and date) and research, mostly on archeological objects. About 50 people work in this lab. They’re organized into teams specializing in rock, ceramic, glass etc. We started with a guard and a badge and waiting for our host in the library which is open to scholars and the public. On this Tuesday, the Louvre (and the library) was closed. Thomas is a physicist with a specialty in materials, particularly rock and it became clear from poster papers on the walls etc. that he is a leader in the research carried out there.



The center serves all of the museums in the country – about 1200. The accelerator, a 3-4 MeV proton (also alphas) pelletron accelerator is called AGLAE – “Accélérateur Grand Louvre d'Analyse Elémentaire.” One unique feature is the beam is in air (there is an exit window). This is very important because many of the precious objects they study would be damaged if placed in vacuum. Most of the investigations are archeological, but there are some art pieces examined also. However, the beam harms white pigment and also can't penetrate thick varnish. Under discussion is a proposal for a more energetic machine. Evidently funding is pretty much in place, but the management of the Louvre is concerned about radiation (as they should be!), so it is unclear when/if that will go ahead.

Along the way to his work area, Thomas took us over a bridge overlooking the laboratory. The ceiling is transparent and from it one can see one of the towers of the Louvre. It is located directly under the Tuilleries but is surrounded by a hedge so visitors are not aware of the giant skylight. As shown in the photo, the offices open onto the light well so they have a source of outside light. Many walls are of glass.



After dropping our coats off in his office, he took us to the control room and introduced us to two colleagues. They are investigating tiny ornaments made of bone, from a pre-historic collar decoration. They are analyzing the make up of the bone and finding other elements that were used for decoration (they think.) We later saw the object in the lab and it is less than a quarter inch. In the photo, it is the orange object on one of the screens.



### The Accelerator

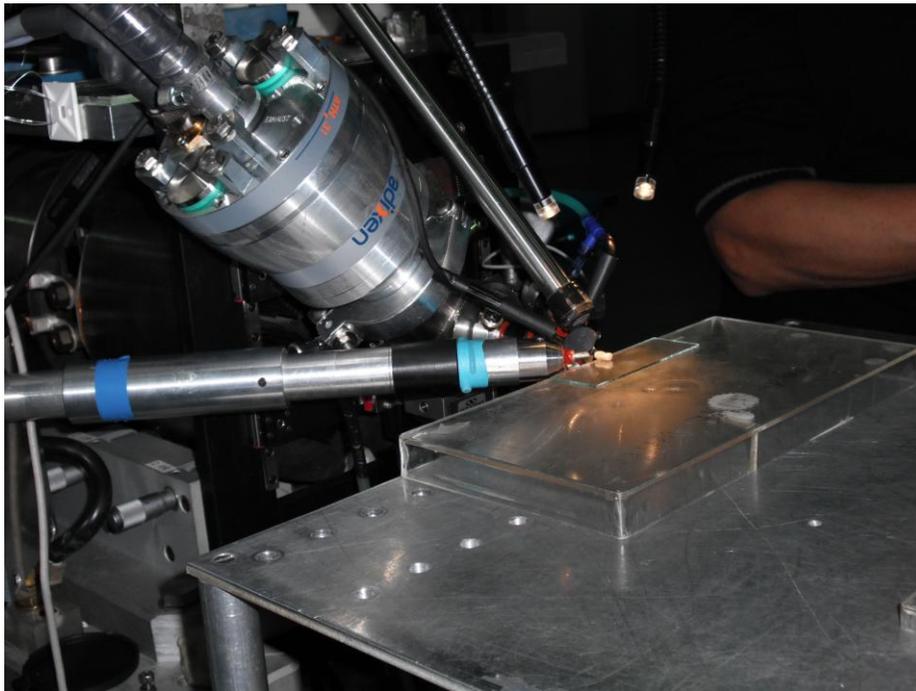
Then Thomas took us to the accelerator. His pride and excitement was palpable. It is a small accelerator but it generates a sufficiently intense beam line for their purposes.



There are two beam lines:



In the control room they can see the image and move the detectors around the object to take different measurements on their computers.



He then told us a story of one investigation done about ten years ago that demonstrates how their work is done and how it relates to the articles in the museum. Ishtar is a small figurine of alabaster (about 5 inches tall with red eyes and a red navel). The curator asked them to determine if the red was red glass or what. Apparently red glass is very difficult to make so that would have been something special. Their analysis revealed the substance to be rubies. This presented a great mystery because the object was found in Babylon near Bagdad. There is no source of rubies anywhere near there. Rubies are found in India, Burma, and many Southeast Asian countries. That was a very long way from there. They couldn't believe it dated back so far because of the difficulty of importing anything from so far.



To determine the source of the rubies, being the Louvre, they talked to the jewelers at Place Vendome (Cartier, etc.) about analyzing their rubies. Jewelers purchase rubies from particular places and the stones are certified. So these fancy jewelry stores loaned them rubies from different places to study. So they analyzed rubies from all of the sources and compared Ishtar's eyes and navel. It was clear (from the trace elements) that they were rubies from Burma. This, however, created another question, how did rubies from Burma reach Babylon? The obvious answer is that there must have been trade routes between the Southeast Asia and Babylon perhaps by ship.

The next step in verifying its authenticity was to look back at the history of the artifact at the Louvre. Records show it was donated by a man who was a diplomat, a French Consul, in Bagdad around 1853. He was an amateur archeologist and was running a dig at a mound in the area of the ancient civilization when the mound disintegrated and revealed a previously undiscovered tomb. Since he was a diplomat, the French government routinely saves all of their papers in perpetuity. Thomas was able to read the letter, which accompanied the gift. In it he described how he came to find Ishtar and said of her, "This is the most beautiful piece I have ever found." He also described the figurine as being made of alabaster (a commonly found stone in that area) and rubies. The fact of the rubies was lost over the years until Thomas re-discovered it.

One of the research investigations done by a team led by Thomas was on a crystal skull from Mexico. The existence of crystal skulls used in religious ceremonies in Mexico and Central America was recently popularized by Indiana Jones and the Crystal Skull. They analyzed the glass and found it to be of more recent origin than people claimed the skull to be. It is not authentic.

The blue paint of a Nile bust also turned out to be inauthentic because the blue paint is of more recent origin. He gave us other examples, obsidian from Mexico that was painted on by Murillo in Spain about the time of the discovery of America. Their analysis revealed the obsidian is, indeed, from Oaxaca. It coincides with the use of what the natives called “smoking mirrors” or obsidian. They were religious objects and the missionaries capitalized on that custom to draw the natives into churches. They covered the walls with obsidian. It is a short step from that to using obsidian as the base for paintings glorifying Christian beliefs.

Since their accelerator is not in a vacuum, they can move even large objects in front of the beam such as a sculpture

There is also a small area using X-rays.



After a fascinating hour tour, Lucile and Thomas discussed with Ernie how they could best use a page in the booklet on Accelerators. They felt that the importance of images with very little text must be maintained. I suggested the story of Ishtar since it is such a dramatic story with many offshoots. They thought of others but discarded them because they don't want it to seem that The Louvre has inauthentic artifacts.



Thomas and Lucile will think about it and make a proposal to Ernie. They will come up with possibilities. In the picture facing out is Ernie, Thomas, and Lucile Beck, Ingénieur de recherche, part of Thomas' team and who had "beam time" that day for the investigation into the little pieces from the necklace, and couldn't spare us too much time.

When we left it was noon and it had started to snow. It was really cold. We managed to catch the 21 bus that drops us off in front of our apartment building. The photo of the Lions is of the Porte de Leons where we left the Louvre. Barbara says it is the best entrance because you can bypass the crowds at the main entrance and it opens onto a gallery of Goya paintings.

