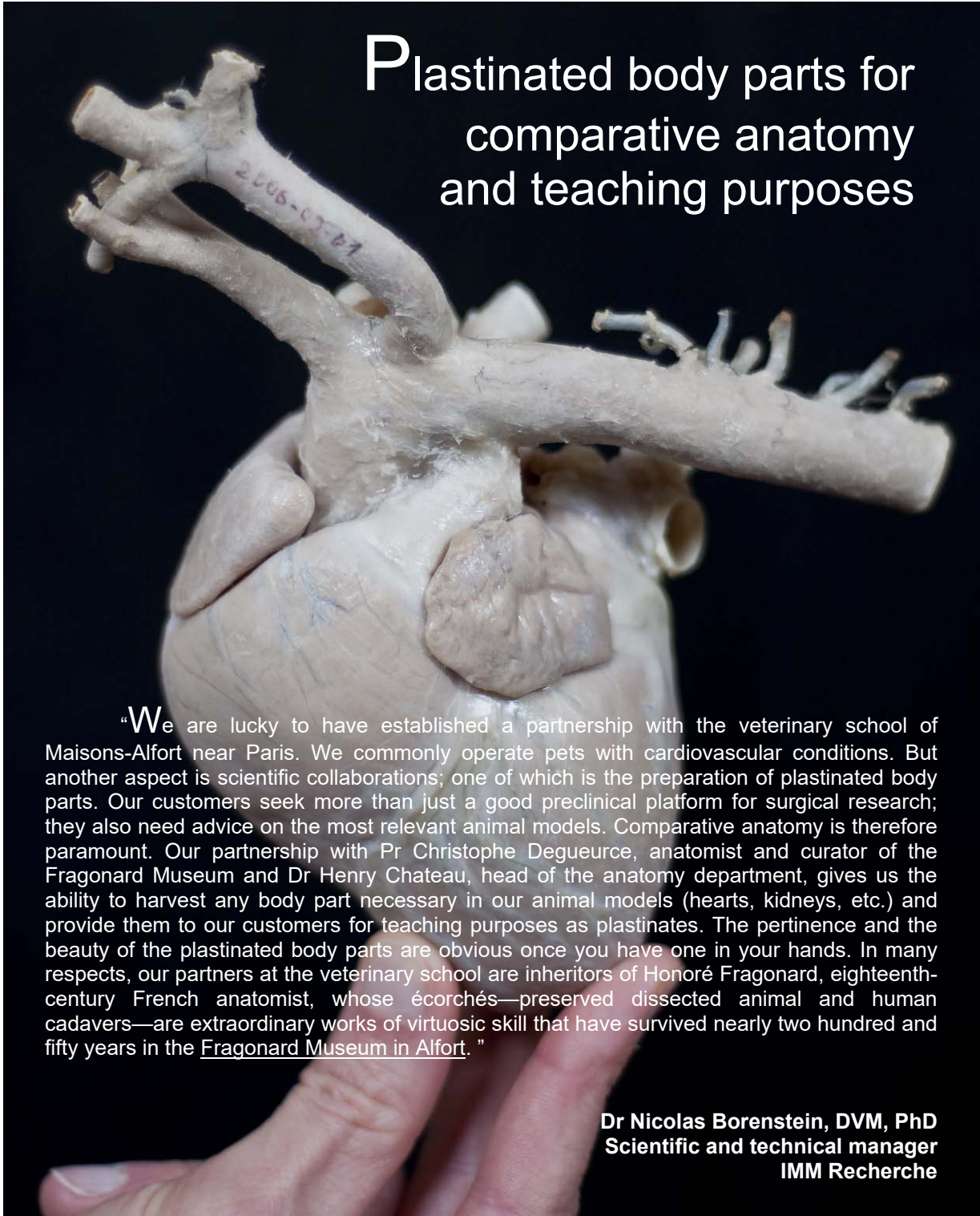


Plastinated body parts for comparative anatomy and teaching purposes



“We are lucky to have established a partnership with the veterinary school of Maisons-Alfort near Paris. We commonly operate pets with cardiovascular conditions. But another aspect is scientific collaborations; one of which is the preparation of plastinated body parts. Our customers seek more than just a good preclinical platform for surgical research; they also need advice on the most relevant animal models. Comparative anatomy is therefore paramount. Our partnership with Pr Christophe Degueurce, anatomist and curator of the Fragonard Museum and Dr Henry Chateau, head of the anatomy department, gives us the ability to harvest any body part necessary in our animal models (hearts, kidneys, etc.) and provide them to our customers for teaching purposes as plastinates. The pertinence and the beauty of the plastinated body parts are obvious once you have one in your hands. In many respects, our partners at the veterinary school are inheritors of Honoré Fragonard, eighteenth-century French anatomist, whose écorchés—preserved dissected animal and human cadavers—are extraordinary works of virtuosic skill that have survived nearly two hundred and fifty years in the [Fragonard Museum in Alfort](#).”

Dr Nicolas Borenstein, DVM, PhD
Scientific and technical manager
IMM Recherche

Plastination is a unique technique of tissue preservation developed by Dr. Gunther von Hagens in Heidelberg, Germany in 1978. In this process, water and lipids in biological tissues are replaced by curable polymers (silicone, epoxy, polyester) which are subsequently hardened, resulting in dry, odorless and durable specimens.

Dr Henry Chateau, DVM, PhD, Head of the Anatomy Department of the Veterinary School of Maisons-Alfort gives us technical insights into this intriguing technique.

“The technique consists of four main steps:

1-Fixation, 2-Dehydration, 3-Forced Impregnation and 4-Hardening (Curing)

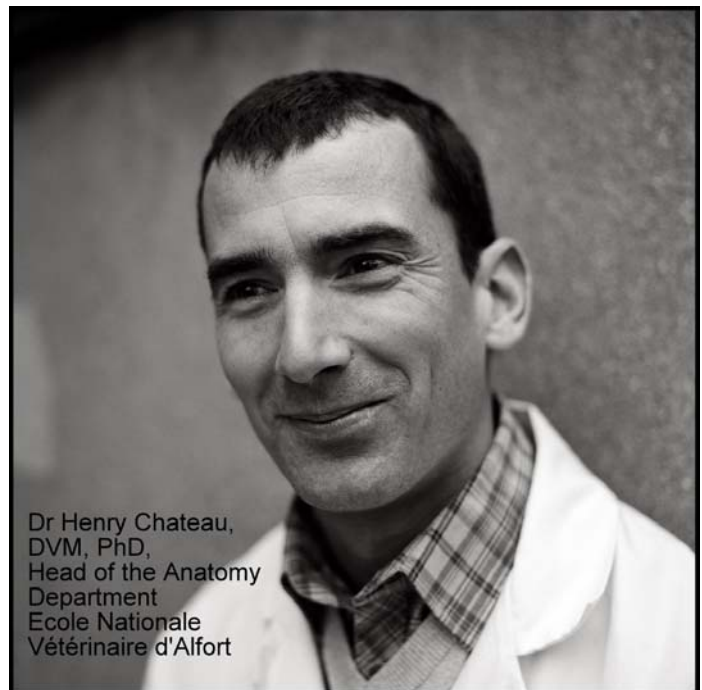
1-Fixation can be done by almost all conventional fixatives, in our case, formalin, which halts decomposition. Dissection of the specimen (removal of fat and unwanted tissue) is often performed at this stage.

2-Dehydration : the specimen is then placed in a bath of acetone. Under freezing conditions, the acetone draws out all the water and replaces it inside the cells.

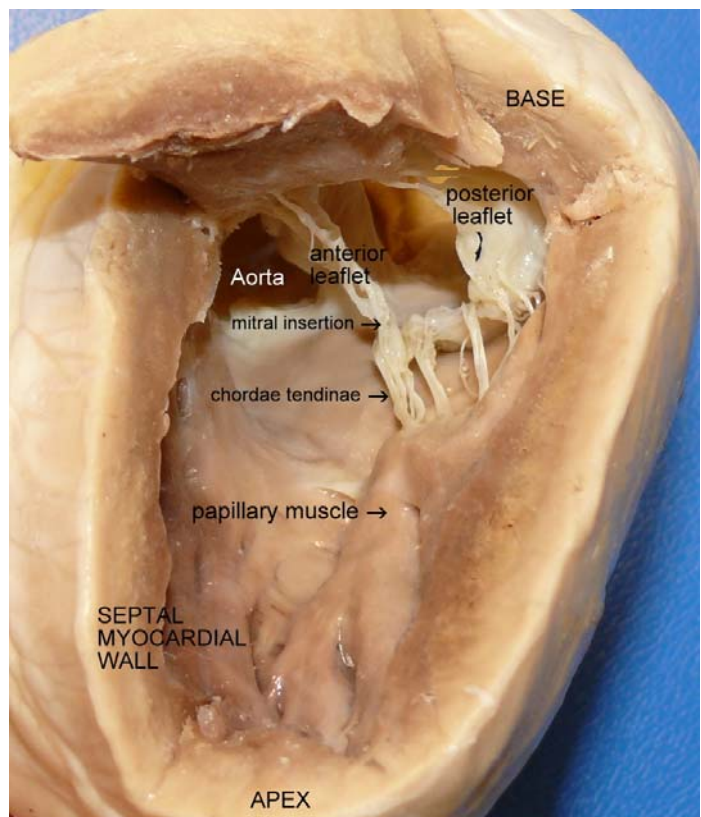
3-Forced impregnation is the central step in plastination: in this third step, the specimen is then placed in a bath of liquid polymer, such as silicone rubber, polyester or epoxy resin. By creating a vacuum, the acetone is made to boil at a low temperature. As the acetone vaporizes and leaves the cells, it draws the liquid polymer in behind it, leaving a cell filled with liquid plastic. Silicon is the polymer of choice for large body parts which keep a natural look.

4-Hardening (Curing): Finally the impregnated specimen is hardened by exposing it to a gaseous hardener or by UVA-light and heat.

Plastinated specimens are perfect for teaching, particularly for neuroanatomy, cardiology or nephro-urology. But virtually any part can be prepared. Silicone plastinated specimens are useful because they can be grasped literally and they are almost everlasting.



Dr Henry Chateau,
DVM, PhD,
Head of the Anatomy
Department
Ecole Nationale
Vétérinaire d'Alfort

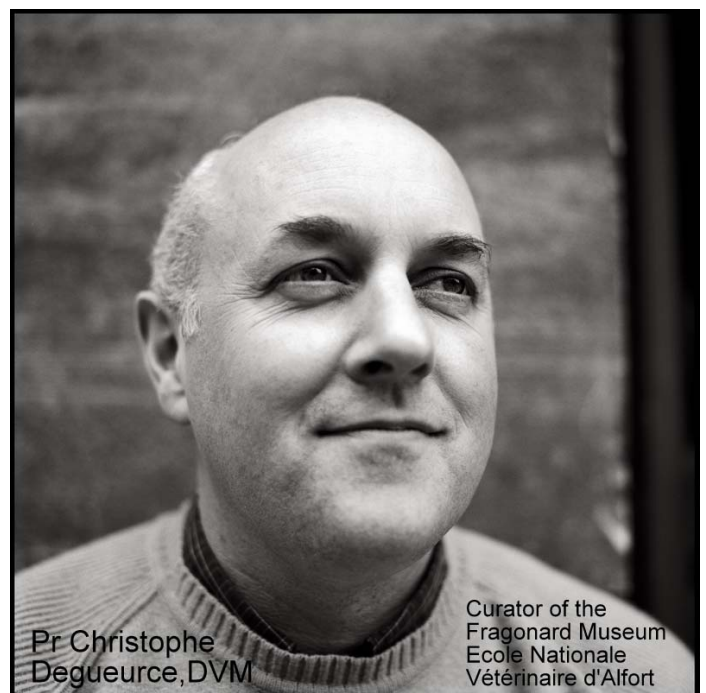



Plastination is carried out in institutions worldwide and has obtained great acceptance particularly because of the durability, the possibility for direct comparison to imaging, and the high teaching value plastinated specimens have.

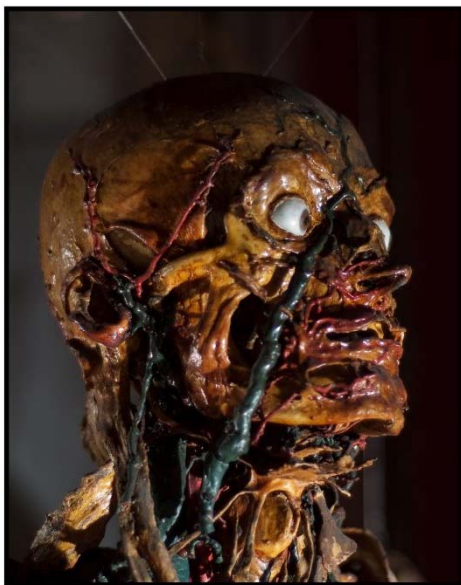
No drawings, nor even pictures, can efficiently replace the great pedagogic skills of real three-dimensional anatomic specimens. A comprehensive understanding of the conformation (shape, size, etc...) of anatomical structures can only be achieved by the visualization and handling of real body parts. Plastinated specimens offer the great advantage of being easy to use even outside the dissection room, making possible to handle them in any situation, especially during tutorials or clinical training. Plastinated specimens are used daily in the [Veterinary School of Alfort](#) for teaching purposes of descriptive and comparative Anatomy but also as a teaching aid for a better understanding of diagnosis, imaging or surgery."

Pr Degueurce is the world specialist of [Honoré Fragonard](#), 18th century anatomist. We asked him in what regard the technique developed 250 years ago is the ancestor of modern day plastination.

« Eighteenth-century anatomist Honoré Fragonard's écorchés—preserved dissected real animal and human cadavers—are extraordinary works of virtuosic skill that have survived nearly two and a half centuries in the Fragonard Museum in Alfort, on the outskirts of Paris. Like the superb anatomical preparations made by the renowned seventeenth- to eighteenth-century anatomist Frederik Ruysch, Fragonard's specimens challenge our understanding of historical science, Western culture, and the display of the dead. A desiccated rider mounted atop a galloping horse, wondrous demonstrations of animal anatomy: these impressive spectacles of permanently preserved bodies are still on display in the stunning collection of the Fragonard Museum. Intriguing, strange, and the rarest of rare, Fragonard's écorchés are specimens from a realm that exists between art and science and are the historical precursor of modern-day plastinated anatomical specimens popularly exhibited worldwide.



It is remarkable that the famous écorchés of Honoré Fragonard have survived the centuries to reach us today. Studies carried out by several teams have established details of the technique used by Fragonard that help to explain their longevity. The injection of the vessels was achieved by means of a mixture of mutton tallow and pine resin diluted in essence of turpentine and essential oils. This gave Fragonard a very high success rate. Above all, he did not add pigments to his mixture while injecting the veins, and this facilitated the procedure. The vessels were painted after preservation to give them the vivid colors that we can still see today. Another detail that explains their exceptional conservation is that the varnish used by Fragonard was composed of Venice turpentine, made from larch resin and known to repel insects. Although there is no historical proof for it, the plastinated body parts we can provide are modern versions and are meant to last for ever.”



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