

A Tale of Two Cities & Two Towns: Part II

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The last time I had seen Paris was in 1983. The dollar was strong, Bob and I were almost newlyweds, and visiting Paris was like a delayed honeymoon. By our second visit in 1995, a number of things had changed, besides the exchange rate. We went to Paris in 1983 because Bob was doing research on a 19th-century French economist, and in his spare time, studying what he really loved, art history. I, on the other hand, was doing research on nothing. In the years since, I found an area of study I love, the aesthetic of biology, and Bob has gotten interested in how science was popularized in 19th-century France. So you could say that we've grown together, intellectually, since our last trip to Europe; he's learned a little science, and I've learned a little about art and aesthetics.

Jardin des Plantes

During our recent visit to Paris, we visited some of the same places we had seen on our first trip, but we looked at things differently this time, in part because our interests have changed. For example, the Jardin des Plantes, the botanical garden that be-

fore the revolution had been the Jardin du Roi, was one of my favorite places in Paris in 1983, so on this trip we headed there the day after we arrived. Bob went with me rather reluctantly because he didn't remember the Jardin as fondly as I had. To him it had been just a place with a lot of flowering plants, but this time he had a different experience. Just inside the gate is a statue of Eugène Chevreul (1786–1889), a chemist who had been Director of the Jardin for almost 20 years. Bob was thrilled to see this piece of sculpture which he had completely ignored last time. In the interim, Chevreul had become, in a sense, an old friend. Bob knew Chevreul from the photographs the famous French photographer, Nadar, had taken of Chevreul at the time of the chemist's hundredth birthday, and from a 19th-century poster picturing Chevreul advocating the benefits of a tonic for long life (Hambourg 1995).

It may seem strange that a chemist was Director of the Jardin des Plantes, but through most of its history, the Jardin has been much more than a botanical garden. It was one of the most important centers for scientific research in France. Several generations of great zoologists worked in the Muséum d'Histoire Naturelle which was built at the Jardin; these include Georges Louis Leclerc Buffon, Jean Baptiste Lamarck, Etienne Geoffroy Saint-Hilaire and Georges Cuvier. There was also a great deal of chemical research done at the Jardin; this was where Louis Joseph Gay-Lussac did his work on gases and where Henri Becquerel discovered radioactivity.

From his new perspective, Bob also took notice of the statues of Lamarck commemorating the "Father of Evolution" and of Lamarck's predecessor as Director of the Jardin, Buffon. I men-

tioned in last month's column, that coming upon such statues makes me feel closer to historical figures I only know through books, and Bob feels the same way. We have been very lucky in our marriage, but sharing admiration for these scientific figures of the past is a new experience, and a very pleasant one. As we continued our walk through the gardens, we agreed that they were much more beautiful than last time. This is true of many of the gardens of Paris, the flower displays seem richer and more robust. We then went to the Jardin's book shop which is in the building where Buffon lived when he served as Director of the Jardin, and where Lamarck also lived. Bob, who hadn't been interested in these associations before, now took a photo of the plaques commemorating these residents.

We had a great time in the bookstore. We went our separate ways and met at the cashier's counter each with a stack of books. One book we both agreed we *had* to have is Luc Vezin's (1990) *Les artistes au Jardin des Plantes* which is a history of the Jardin from the point of view of the artists who derived their inspiration from it. Not surprisingly the work of the great botanical illustrator Pierre-Joseph Redouté is featured here. Toward the end of his life, he was named master of plant drawing at the Museum of Natural History, where other famous artists also served. In the era before color photography, artists were particularly important to biological research, producing illustrations of plants and animals which were both accurate and aesthetically pleasing. The great *animalier* or animal artist, Antoine-Louis Barye (1795–1875), was professor of zoological drawing at the Muséum d'Histoire Naturelle from 1854 until

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his death. He was an obvious choice for the position because he spent so much time at the Jardin. He studied the specimens in the Museum's collection and also regularly visited the *Ménagerie*, or zoo, to paint live animals.

Barye is known for his paintings and sculptures of wild animals, particularly lions and tigers, but he never traveled outside the Paris area. He found all his models in the Jardin and in the menageries of traveling fairs (Baillio 1994). When a lion in one of these shows died, Barye and the great French romantic painter, Eugène Delacroix, rushed to the scene to sketch the animal and study its internal anatomy. He and Delacroix often sketched together at the Jardin, but the results are very different. Looking at the same animals, Delacroix painted more loosely, making his animals very dynamic; while Barye's work is smoother, more finished, making his animals very sensuous. The naive painter Henri Rousseau also sketched lions and tigers at the *Ménagerie*, and then in his paintings, set these animals against lush, rain forest-like backgrounds. When we visited the *Ménagerie*, we found some areas very similar to what Barye or Rousseau would have seen. The bears are found in a brick-lined pit as they were in the 1840s; and many other animals occupy rather small cages. But a large *fauverie* for lions, tigers, panthers and other large carnivores was built in the 1930s, and there are now outdoor areas where animals such as the Asian mara and several antelope species can roam freely.

When we were at the ISHPSSB meeting in Leuven [see last month's column], we heard a paper presented by Richard W. Burkhardt, Jr. (1995) in which he discussed the reasons for the *Ménagerie's* establishment. The most immediate reason was that in 1793, due to the political upheavals of the time, traveling animal shows were losing money and their proprietors were abandoning their animals in the streets of Paris, creating a public nuisance and menace. The Jardin was called upon to accept these animals and house them since there was a good deal of open space there, and the animals could be studied by the zoologists working at the Museum. But these researchers were accustomed to studying dead specimens and were not particularly interested in live animals, so the possibilities for studies of animal behavior and reproductive biology were not aggressively explored.

Several other reasons besides public safety and the advancement of science

were also offered for the establishment of a permanent menagerie. The *Ménagerie* would provide a place where animal gifts from heads of state could be housed, thus adding to the dignity of the nation. It would also be a place where artists could paint live animals and where cross-breeding experiments which might be of agricultural importance could be conducted. The *Ménagerie* did become the home of several large animals given by heads of state, including two elephants and a giraffe. The latter became extremely popular when it arrived in 1827. And as I mentioned above, the *Ménagerie* did serve artists very effectively, though the research on live animals did not become important until the 20th century.

Muséum d'Histoire Naturelle

Walking through the Jardin and the *Ménagerie* was enough for one day, so we left the Muséum d'Histoire Naturelle for another time. I'm glad we did because it is a large museum and one I wanted to really savor slowly. The Muséum was reopened in 1994 after having been closed for almost 30 years (Laissus 1995). There were a number of reasons for the delay, but Jürg Kreienbühl's 1985 painting, *J'accuse*, which portrays the dusty animals standing in the abandoned main gallery, implies that political and economic considerations had come ahead of science. Yet part of the delay was unavoidable. New storage areas were built beneath the Muséum, and it was only when specimens could be moved out of the galleries and into this new facility that renovation could begin. The result is wonderful. The huge main gallery, which is five stories high, has been retained. There are two floors of exhibits below the main exhibit floor where elephants, giraffes and other large animals parade across the floor as they did in the old exhibit area. There are also two exhibit floors above it on the balconies overlooking the animal parade. On the top floor the exhibit deals with evolution and starts with displays of original editions of some of the classics in the history of biology including the work of Buffon, Lamarck and Darwin. Many of the concepts of evolution including natural selection and the importance of isolating mechanisms are clearly illustrated in beautiful displays.

On the floor below is an interesting exhibit on how humans use animals. The history of domestication is pre-

sented as are human-related extinctions. The theme on the main exhibit floor is the diversity of life. Besides the large animals that take up the center space, there are displays of representative species, from insects and other invertebrates to amphibians to reptiles, for each of the great regions of the world. While some of the old display cases are used in the exhibits on the upper floors, here the display cases are very modern: clear lucite with just enough species on view to make the point about diversity but not enough specimens to overwhelm the viewer. The benefit of having underground storage is that specimens for display can be chosen carefully and the rest stored out of the public's sight. The old museum displays exhibited thousands of specimens lined up in glass cases.

On the ground floor the diversity of life theme continues, with an exploration of the aquatic world, and on the lowest level is a temporary exhibit on human uses of forests. A range of wood products is displayed and the problems of forest preservation are presented. Like all the others, this exhibit is very well done and very up-to-date. In a sense, it was a good thing that the Muséum was closed for so long, because it allowed for a complete renovation. No part of this museum is out-of-date. While in a few years this may present a problem since all the exhibits will become threadbare at the same time, right now it's a pleasure to see everything in great shape and every exhibit based on the latest information. It makes the other great natural history museums, including those in New York and London look a little shabby; these institutions have never had the luxury of closing up shop for an extended period of time and getting a total face-lift.

La Cité & Le Palais

Paris also has a relatively new science museum, La cité des Sciences et de L'Industrie, which opened in 1989 as part of the celebration of the bicentennial of the French Revolution. La Cité is on the outskirts of the central city in a park that also contains an exhibit hall, La Cité de la Musique, and La Géode which houses a huge hemispheric screen showing spectacularly photographed films including one on Yellowstone and another on space travel. The museum itself is housed in a huge, modern building which was originally planned as a slaughterhouse and meatpacking

plant, hence there is a great deal of open space which means that it can handle large crowds. The exhibits here are much more interactive than those in the Muséum d'Histoire Naturelle. But only one or two people can work with an interactive display at any one time, which means that La cité really can't handle very large crowds effectively. Of the science-related museums I visited in London and Paris, this is the one I liked the least. Aside from a very well-done math exhibit, most of the other displays had too high a glitz-to-content ratio for my taste.

I had much more fun at Le Palais de la Découverte which is in the heart of Paris, right off the Champs-Élysées. It was established in 1937 in a building erected in 1900 but I found it more exciting than the thoroughly modern La Cité (Maury 1994). I had visited Le palais in 1983 and was impressed by the old exhibits on electricity, a topic that has fascinated the French since the 18th century and is a major reason why Benjamin Franklin is so highly regarded in France. This interest in electricity continues to this day, though, unfortunately, the old exhibits are gone, replaced by new interactive exhibits on electricity and on electrostatics. There is also a wonderful temporary exhibit on symmetry. My only disappointment with it was that it was so popular and so interactive that I didn't get a chance to tinker with each of the stations. Though a few of the exhibits at Le Palais were there when I visited in 1983, most of them are more recent, and even the older exhibits, like one on genetics, have been updated and spruced up.

Maybe it is the scale of the building which makes Le palais seem friendlier and more dynamic than La Cité. While it is a "palais," there is none of the wide-open, glass-walled space of La Cité. And the exhibits are more fun because they are backed up with demonstrations throughout the day. Each of the main exhibit areas has a small theater where docents give entertaining and visually exciting presentations. But my favorite exhibit was one designed to be explored on your own. It's called Eureka and contains a large number of interactive stations where you can discover for yourself the limitations of perception, why your muscles work the way they do, and just what Newton's laws of motion are all about. It is a discovery area that gives the participant just enough information without being overwhelming. I'm not sure that I would ever bother to return to La Cité, but I know that Le

Palais de la Découverte is on my list for our next trip to Paris.

The Pasteur Institute

I had missed visiting the Pasteur Institute in 1983, so I had it at the top of my list for this time. Like many businesses and institutions in Paris, the Institute's museum closes in August, a fact I was unaware of until I tried to visit in the middle of that month. In one sense, I'm glad I had to wait because, since that time, Bob has gotten interested in Louis Pasteur (Hendrick 1991), so we set off for the Pasteur Institute together. On the ground floor, there is a small exhibit on Pasteur the Man, but the museum itself is on the second floor. It is composed of the apartment that was constructed for Pasteur and his wife when the Institute was built. The first room you enter is his lab which now contains exhibits commemorating each of his major research interests. The first display concerns his work on the asymmetric crystals of tartrate and includes some of the crystals themselves as well as models of the crystals which he used in explaining his research. There are also displays dealing with his work on silkworms, wine, anthrax, and of course, rabies. Moving from case to case, makes you realize the breadth of his research and also of how the projects are related to each other, because all somehow involve microorganisms. In the center of the room are the lab tables where Pasteur worked; they are now used to display some of the larger pieces of equipment he used including several items such as sterilizers which were specially designed by his coworkers.

After visiting this exhibit, we were taken on a tour of the rest of the apartment. On the same floor as the lab is his bedroom, that of his wife, and a large bathroom with a rather uninviting bathtub. There is also a small sitting room where Pasteur liked to play cards in the evening. We were then led downstairs; the stairs were specially designed with shallow steps to make allowance for the fact that the stroke which Pasteur had suffered several years earlier had left his movements slightly impaired. On the first floor are the more public rooms: a reception room, a dining room and Pasteur's office. All the rooms are beautifully furnished with heavy Victorian furniture and elaborate drapes and wall coverings. By the time Pasteur moved here in 1889, six years before his death, he was a famous man

and this apartment indicates the regard in which he was held. Displayed throughout the rooms are awards he received and photographs memorializing his achievements; for example, there are several photos of children he treated with his rabies vaccine. Also hanging on the walls are a number of paintings he did during his adolescence; these include portraits of his parents which are quite good. Obviously the eye which Pasteur brought to the microscope was the trained eye of an artist.

The last part of the tour was the most memorable. The guide took us down into the crypt where Pasteur is buried. I knew that his tomb was at the Institute, but I was not prepared for anything so elaborate. Wrought-iron gates lead to steps down into a rather large room with the marble burial stone in the middle and an altar, where Mrs. Pasteur is buried, at the far end. Except for the walls on either side of the tomb where Pasteur's major accomplishments are listed, the entire crypt is covered with mosaic tiles. One tableau depicts a rabid dog, another shows sheep calmly grazing anthrax-free. While this crypt is not quite as elaborate as the one where Napoleon is buried at the Invalides, France's military museum, it is nonetheless quite impressive. As Bob reminded me, a survey in the 1960s found that French schoolchildren still named Pasteur, more than anyone else including Napoleon, as the most important Frenchman in history. This crypt is a visual symbol of the high level of regard in which Pasteur is held.

We also visited the Musée d'Histoire de la Médecine on the Left Bank. It is housed in the Université René Descartes, Paris's college of medicine, and has been recently refurbished. The Museum itself is on the top floor of the College and is one large room with a balcony running around it. We had to work to find both this museum and the one at the Pasteur Institute, but one of the benefits of their inaccessibility and of their specialized nature, is that they are not inundated with tourists as is most of the rest of Paris.

At one end of the room is a carved-wood human anatomical figure, a good reminder that the plastic figures we are so familiar with today are a 20th-century phenomenon. However, most of the anatomical figures of the past were made not of wood, but of wax, and several of these are also on display. There are exhibits of surgical instruments of the past, some of them too painful looking to discuss. On the

more bizarre side was a table with a glass top under which are arrayed petrified body parts such as ears, fingers, etc. This unique piece of furniture was given to the Emperor Louis Napoleon who, I'm sure, rapidly donated it to the Musée. Among the more interesting and less ghastly items on display were one of Claude Bernard's notebooks, one of the first polygraph machines, and several early artificial limbs including one made by Ambroise Paré [1510–1590], a noted French army surgeon.

Bernard Palissy

Besides visiting all these museums and a number of art museums as well, we did a great deal of walking. One of the pleasures of walking in Paris is that you are sure to come upon something interesting. Across the street from the Jardin des Plantes is an elaborate fountain dedicated to the zoologist Georges Cuvier; it is complete with scantily clothed women, an alligator, a lion, and several other large animals. Off the Boulevard St-Germain, we came upon Deyrolle, a taxidermy establishment where you can buy anything from a single butterfly to an elephant or camel or bear. The interior looks like it belongs in the 19th century, with wood-trimmed glass cases and endless drawers of specimens. It is well worth visiting, and it is unlikely that you will be able to leave without making a purchase. Another find was in a small park next to the church of St-Germain du Prés. Here is a statue of Bernard Palissy [1510–1589], a potter who is known for his plates decorated with reptiles, fish, insects and plants. There is a beautiful

example of his work in the Metropolitan Museum of Art, and I make a point to look at it every time I visit the Museum. We kept coming across Palissy's work in Europe, too. There is a platter with very dark, rich colors and a nice, large fish in the British Museum, and another platter in the Petit Palais in Paris. At the Musée des Art Décoratifs which is part of the Louvre, there are several 19th-century copies that were just not as exciting to look at as the originals.

I'm not sure why these platters fascinate me so much. Perhaps it's because they so intimately combine art and science. Palissy used live organisms as models for his pottery, and the dynamism of life comes through in his work. He was obviously a close observer of nature, to make his figures so life-like. He was obviously also a very talented artist to color his pottery with such rich colors that complement each other so well. He developed his own ceramic techniques, and he also was a talented naturalist who lectured in Paris and wrote books on natural history, particularly on geology. He was one of the first to surmise that fossils are the remains of once-living organisms (Thompson 1954).

Palissy's statue, which was sculpted by Barrias in 1880, shows the potter leaning on a kiln which is open to reveal pieces of pottery inside. He is holding one of his plates and there are fossil ammonites and large crystals at his feet. I sat and looked at this statue for quite awhile, partly because I was hot and tired, and partly because I felt as I had many times on the trip: I was making contact with someone, getting to know them better, finally meeting them "in person" in some way. Pa-

lissy is one of those figures in the history of science who is hardly remembered today, but whose love of nature and careful observation of living things contributed to the early development of biology. Sitting looking at Bernard Palissy's statue made me realize a little more clearly the European's deep sense of history. I was looking at a 100-year-old statue of a man who has been dead for 400 years. Somehow, the history of biology became a little more real for me that afternoon at the end of my tour of two cities and two towns.

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