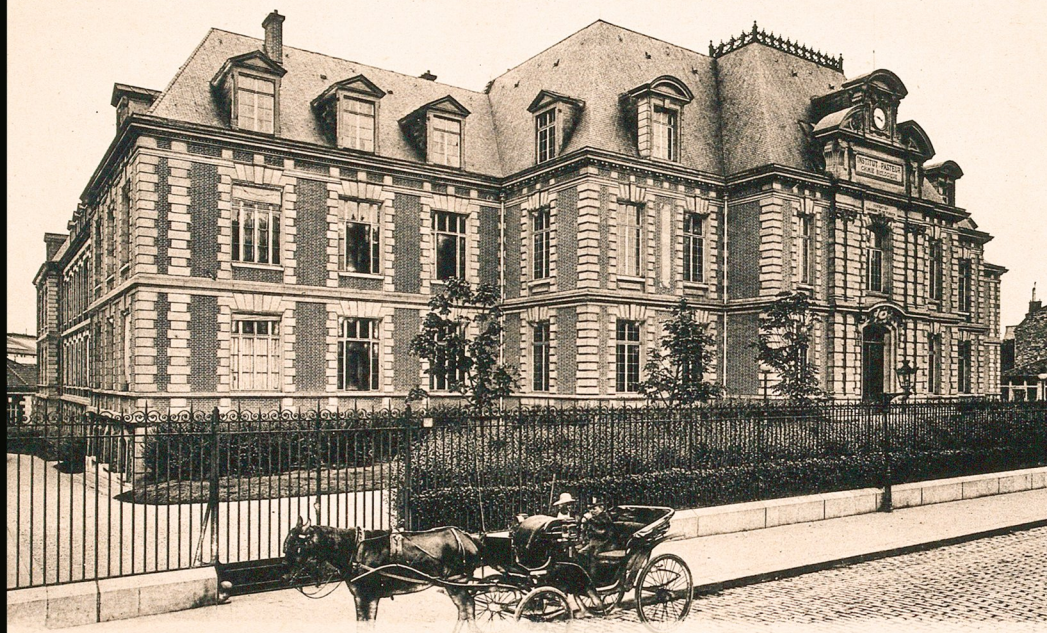


THE STORY OF THE PASTEUR INSTITUTE

AND ITS CONTRIBUTIONS
TO GLOBAL HEALTH



MARIE-HÉLÈNE MARCHAND

The Story of the Pasteur Institute and Its Contributions to Global Health

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By

Marie-Hélène Marchand

Cambridge
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PREFACE

Between legend and modernity

As we all know, it is many decades since Pasteur's life and work entered into legend. Who is not familiar with the history of the man who scotched belief in spontaneous generation, defeated rabies, and came to be known in his own lifetime, and is still honored today, as one of the greatest benefactors of humanity?

Any number of works, ranging from the hagiographic to those more directly scientific in their inspiration, have set out to relate the epic tale of Pasteur, the great scientist, and his no less famous disciples, Roux, Yersin, Calmette and so many more.

The very creation of the Pasteur Institute, subject of an international subscription campaign whose list of donors included such prominent figures as the Tsar of Russia and the Emperor of Brazil, only added further luster, if such were needed, to the symbolic image of this glorious past.

Yet while the famous institute continues to enjoy a worldwide reputation, the general public, as the author of this history underlines, has very little idea of what goes on here, retaining only the image of a major center for vaccines and vaccination. Hence the resurgence of attention whenever certain epidemics break out. And the undeniable interest of the "personal story" told here by Marie-Hélène Marchand stems precisely from the dual light it holds up to history for the reader's benefit: first, taking its inspiration from the traditional epic, bringing the legendary past of the Institute and its leading figures to life with remarkable scholarship, while transporting us back in time to the aftermath of the last war and describing its contemporary activities, a complex tale, marked by phases of innovation but also by upheaval. For while the Institute may justifiably pride itself on the rich variety of themes addressed in the general field of life sciences, and on a community of outstanding researchers possessed of sometimes prodigious talents, including many a Nobel laureate, that same community can also be extremely demanding! Well aware of its mission, it can sometimes take a rebellious turn... The life of the directors that have

succeeded one another at its head, even leaving financial crises out of the reckoning, was rarely smooth and without incident.

Thus we are led to a clearer perception of some of the great transitions, not to say the great challenges, that the Institute has faced. Certain transitions were rooted in the contrasts between the scientific and medical figures running the institution, as in the wake of the death of its founder, an event that posed many very real challenges to which his disciples nevertheless proved equal, at the cost of bitter battles such as those fought by Duclaux, Grancher, Roux, Calmette, Yersin and many others. Other transitions of a scientific nature are associated with the massive “revolutions” that transformed biology itself: one such instance was the shift from microbiology to molecular biology (illustrated by Monod, Jacob and Lwoff). Another, more recent, followed the technological upheavals created by the rise of genomics, developmental biology, the neurosciences or the use of stem cells.

Over the past three or four decades, at the Pasteur Institute as at other research institutions, in France and other countries, we have all had to contend with an unprecedented acceleration in the life sciences, with considerable developments in technologies and instruments, not to mention the expanding numbers of the international scientific community. Hence the fierce competition that has ensued on the international stage, and the changing attitudes of civil society itself with regard to research in general; and all in a context where administrative burdens are increasingly numerous and where the national economy is itself in turmoil.

In times such as these, the Pasteur Institute is therefore faced with the need to make its tradition of excellence compatible with the new imperatives brought about by the evolution, often sharply marked, in biomedical sciences, and with the new conditions under which these sciences must now operate.

No one could be better placed to retrace for us this vast and complex journey than Marie-Hélène Marchand, who served as Secretary General of the Pasteur Institute from 1983 to 2005 and therefore became familiar with the workings, however convoluted, of this great non-profit foundation.

As a result of the direct contact she enjoyed, over a period of almost thirty years, with several of the Institute’s Presidents – Raymond Dedonder, Maxime Schwartz and Philippe Kourilsky – whom she accompanied in

their tasks and assisted to the best of her ability, she is able to paint an objective picture of their missions and their individual personalities.

Yet, by the very nature of her job, Marie-Hélène Marchand also forged direct links with donors, often leading lights of the jet set, and she offers us her portraits of these figures, too, in a kindly spirit not without touches of humor.

One very important development has to do with the famous and somewhat stormy donation of jewels owned by the Duchess of Windsor: stormy, in that the initiative was not particularly to the taste of the British Crown!

This gift did, however, breathe new life into the Institute, making renovation of its historic buildings possible.

Another story relates to the far-reaching Pasteur Institute International Network and associated institutes, first founded in the time of Louis Pasteur himself in various parts of the globe, which has now reached the record total of 32 institutes.

Although independent of Paris and governed by statutes specific to the countries concerned, these institutes are nonetheless in frequent direct contact with the “parent” institute. Their story, as told here, is of great cultural interest.

During her time as Secretary General, Marie-Hélène Marchand was also an attentive witness, on occasions directly involved, alongside the Scientific Director, in the regular exchanges between the Pasteur Institute in Paris, the wider world of French scientific research institutions in the public sector, leading universities, and the pharmaceutical industry.

As clearly emerges from the pages of this book, its author has frequently been a privileged observer and sometimes a direct actor in these multiple and complex interactions. She writes of them with great objectivity, rarely putting herself forward in her account yet writing with all the passion and emotion of someone with a great love of this enchanted realm of memory, fully aware of their extraordinary history yet also intensely engaged, both personally and professionally, in the various workings of the collective life of this great Institute, even down to its battles!

The result is a book that is both rich and captivating, a living and original portrait of the Pasteur Institute, which General de Gaulle supposedly ranked alongside the Eiffel Tower and the Collège de France as the three things that mattered most in the eyes of the French.

François Gros
Honorary President of the Pasteur Institute
Permanent Honorary Secretary of the Académie des Sciences
Honorary Professor of the Collège de France

INTRODUCTION

What exactly is the Pasteur Institute? This was the question I asked myself as, newly appointed as its Secretary General, I climbed the front steps of the Institute on March 1st, 1983. I knew as much about it as anyone else, which is to say very little. The textbook image retained from childhood, that of the illustrious scientist and benefactor of humanity, has stuck with many a generation since the end of the 19th century and imprinted on the collective imagination a picture of the Institute, the home of vaccines and public health.

I was gradually to discover this “secular cloister” where tradition and hagiography cleverly conceal a complex human reality, emotional yet bitter, certainly endearing. The Pasteur Institute is certainly in a paradoxical situation: despite being perhaps the most famous French institution of all, no one really knows a thing about it. The opinion polls that successive management teams persist in commissioning invariably report that, although the Institute is very well known, the general public has no idea what it actually does. The belief still persists that it is a public institution, (when in fact it has been private since its founding in 1887), and that it produces vaccines, when it has been over 40 years since the Institute engaged in any manufacturing whatsoever. Even though the Pasteur Institute is part of France’s national heritage, too little is known of its historic role, the part it played in spreading France’s influence under the Third Republic thanks to its expansion overseas, and the part it played in major scientific breakthroughs during more than a century.

This book is therefore a first-hand account, a personal history of the Institute destined for all those, and they are many both in France and elsewhere who know the Pasteur Institute by name only, and for younger researchers: it aims to introduce them to an institution whose history will no doubt be unfamiliar to them.

The Pasteur Institute was, for me and for many others, an atmosphere, a history. We took pride in serving an institution that occupies a place like no other: its atmosphere due in large part to the old-world charm of buildings dating from the 1900s and the ghosts of the “great Pasteurians”;

its history is studded with outstanding scientific discoveries and eminent individuals: this institution made major contributions, in France and around the world, to the development of biomedical research and improving public health. General de Gaulle once paid tribute to the Institute by saying that there were three things in France that should always be preserved: the Eiffel Tower, the Collège de France and the Pasteur Institute.

When I arrived at the Pasteur Institute in 1983, my secretary, who had worked there since 1943, still spoke as reverently of Monsieur Pasteur as if she had actually known him; management files had been archived since the beginning in imposing red boxes lining the wax-polished library shelves, minutes of Board meetings were handwritten “in the English style,” using exquisite calligraphy, and any communication, sober in the extreme, focused solely on the traditional fields of the Pasteur Institute, namely infectious diseases; some of the researchers had actually known, if not Pasteur himself, then at least Emile Roux or Alexandre Yersin.

A family atmosphere still reigned; all the researchers knew one another, and the director knew all of them: the Pasteur Institute had no such thing as a logo and its name was still written in Gothic characters as it had been since 1887!

Within a generation, this model had exploded: the scale had shifted such that the director could not possibly know all the researchers, now far more numerous and many from abroad; the inevitable turnover of both scientific and administrative staff gradually erased shared memory and altered operating procedures. Increasingly specialized research had tended to isolate researchers more than ever within their own particular fields and knowledge of the Pasteur Institute’s history has faded for the youngest generations.

But, as one illustrious Pasteurian on the eve of retirement, Elie Wollman, wrote to Professor Lépine in 1985, following the celebration of the centenary of the first anti-rabies vaccination, “In the case of the Pasteur Institute, we must constantly bear in mind the spirit of its past, its present and its future to ensure harmonious continuity between them. For to neglect any one of these aspects would be to imperil the Institute’s very existence.” This book is, in some sort, a response to the duty of remembrance owed to an institution whose name and prestige have stood the test of time, owed to those, prominent or unknown to the general

public, who have contributed or contribute now to its fame, and owed to those patrons so generous with their wealth or their time, who have supported it from its founding, some of whom have been of the greatest assistance to me in my task.

As an introduction to the Pasteurian universe, I invite you to join me on a guided tour of some of this enchanted realm of memory on the Pasteur Institute campus. Once the scene is set, we will revisit the major contribution to science and medicine made by Pasteur, and the principal discoveries of his successors.

In a second section, we will see how Pasteur's heirs have handed the founder's spirit down from generation to generation through a history that has not always been smooth and untroubled, and we will identify these Pasteurians through a series of portraits from the past and from the present. Lastly, in a third section, we will address the phenomenal reputation of the Pasteur Institute, in France and around the world, as witnessed by the manifestations of support, commemorations and the steady flow of bequests that have made up part of its funding for 130 years.

The Institute is in constant contact with sectors as diverse as industry, executors, donors large and small, government authorities, leading French and foreign research institutions, etc. Over the following pages, we will see the links Pasteur Institute researchers maintain with their overseas colleagues, particularly in the English-speaking world. The Pasteur Institute is by no means an inward-looking institution. All this has built up the reputation of the Institute for more than a century, and guaranteed it a place of its own in the French system of research organizations. The Pasteur Institute is not a cold institution, governed by some sort of disembodied discipline, but a living home, whose "inhabitants" are driven by great passion, anxiety and sometimes, it must be admitted, irrationality. This fact is always disconcerting for the non-scientist who automatically associates the world of science with pure logic. In reality, the "serene peace of laboratories and libraries" that Pasteur spoke of is not so easily achieved! Yet, through all the crises and difficulties, the Institute has always proved able to stick to its path and advance in its battle for public health.

And that is the specific nature of the Pasteur Institute that this book will attempt to convey, through historical facts, anecdotes and personal memories. I have been lucky enough to work with three presidents¹ and five Chairmen of the Board of Directors², including François Jacob, the only Pasteurian scientist to have served as President of the Institute. Working alongside them, I experienced the everyday reality of an institution, a reality made up of stressful, difficult or gratifying moments and fascinating encounters, and I owe them all an immense debt of gratitude.

I hope, in any case, that this book will encourage many to learn more about the Pasteur Institute with the same interest I have felt for this exciting and engaging institution. It was written as a tribute to both the Institute and its researchers.

Marie-Hélène Marchand
Honorary Secretary general of the Pasteur Institute



Louis Pasteur, photographed by Nadar, in 1886.

PART I

THE PASTEUR INSTITUTE: A TALE WORTH TELLING

“On the one hand, Pasteur had the temperament of a dreamer and of a romantic artist; he allowed himself to be guided and inspired by the mirage of an imagination that ranged far beyond the horizon of established knowledge, at times even beyond common sense. On the other hand, he had a compulsive urge to observe and investigate concrete situations, as well as to exert a puritanical control over himself and the external world.”

René Dubos, *Pasteur, Free Lance of Science*,
A Da Capo Paperback, 1960.

A LIVING LANDMARK

“This is the beginning of post-exposure rabies prophylaxis... A rabies vaccine center should be set up.”

Louis Pasteur, Académie des Sciences, March 1st, 1886.

To the reader wholly unfamiliar with the Institute, I offer my services as guide on an initial tour of the campus to soak up the atmosphere, before seeking a deeper understanding of this mysterious universe. In another life prior to my time here, I was asked to organize a visit to the Institute for an eminent American academic, the Provost of the Massachusetts Institute of Technology (MIT) in Boston. I called the Institute to make the arrangements, and was put through to the deputy director, Elie Wollman, who was responsible, among other things for public relations.

I had no idea at the time who he was and was only later to come to know this eminent Pasteurian. In answer to my request, he replied sarcastically that the Pasteur Institute was not the Eiffel Tower and there was therefore no point in planning a visit for this American, however important. This was, you might say, my first introduction to the Pasteur Institute. Things have changed a lot since then, however, and the Institute now welcomes many visitors.

An Initial Tour of the Campus

When the Académie des Sciences decided, on March 1st 1886, to second Pasteur’s wish to “set up an anti-rabies vaccine center” and launch a public subscription in France and abroad to pay for its founding, one of the immediate needs was to identify a site. Pasteur hesitated between Paris and Villeneuve-l’Etang, in Marnes-la-Coquette, where the Ministry of Public Instruction had allocated him a substantial property for the study of contagious diseases.



Photoengraving by Fortuné-Louis Méaulle, published in *Le Journal illustré* on November 25, 1888. It shows bite victims who have come to the Pasteur Institute to be vaccinated against rabies.

The latter option was finally abandoned, and the Institute was to be built in Paris. In June 1886, the Paris city council had offered a site that it would make available to the Institute for a period of thirty years, after which it would reclaim the site with all its buildings. Pasteur decided to refuse these unacceptable conditions “without rancor but with dignity.”

The decision was made to purchase a plot of land on rue Dutot (part of which would later become rue du Docteur-Roux) and remain independent. A milestone on the edge of a village gave the distance from Notre-Dame as 3.5 kilometers. The milestone, visible today from the street, now rests against the ground floor of the AIDS building at 217, rue de Vaugirard. This area was still countryside at the time, and the site, planted with orchards and kitchen gardens, seemed quite remote to Pasteur, but he decided to purchase it anyway.

Only a few years ago, the surroundings of the Institute on rue du Docteur-Roux still had all the air of a late 19th century public park. The flowerbeds on either side of the street were choked with a dusty growth of ivy, untouched since 1888. On arriving at the Institute, I suggested to the Executive Committee (which debated matters both large and small) that the ivy be ripped out and replaced by grass and flowers. This perfectly reasonable proposal was met with a profound silence, until Mr. Wollman

exclaimed categorically, “This is revolution!” Mr. Dedonder, the President of the day, was a man of great good sense: he liked flowers, and the ivy was grubby. From that day forth, I realized that the Pasteur Institute was a complex place where changing things required careful thought.

Should you stroll along rue du Docteur-Roux on a weekday, beneath the century-old chestnut trees planted in Pasteur’s day,³ you will witness flocks of people in white lab coats crossing from one side of the street to the other only to disappear into a labyrinth of buildings and laboratories. Researchers and technicians go about their business in these buildings on a site covering, though no one would guess it, a total of five hectares or just over 12 acres. Gone is the old-world charm of the gardens where the wives of the first Pasteurians would take their young children for their afternoon walk in the 1900s. In those days, the rear section of the campus, at 25, rue du Docteur-Roux, housed stables and the warehouse of a hackney cab company, l’Urbaine. Further along were the rabbit hutches, an aviary and a lightly wooded patch of land that rose gently towards rue Falguière; a kitchen garden where the gatekeeper grew vegetables created a rustic note enhanced, according to Pozerski de Pomiane, by the song of blackbirds.

As more buildings went up, these witnesses to another era gradually disappeared, even the glorious cherry tree that stood against the wall of the former laboratory of the hospital, as did the linden at the foot of the Duclaux building that made every June fragrant. And whatever happened to those lilacs?

From the outset, however, the emphasis is on the origins of the Pasteur Institute, as the first sight to greet the visitor is a statue of the shepherd boy Jupille. Honored because he was bitten while attempting to save his friends from a rabid dog, Jupille was the second “bite victim” saved by Pasteur, after Meister. Reminiscent of a Florentine bronze, the statue stands outside the lodge where Jupille would one day serve as gatekeeper to the Pasteur Institute. With his very own statue to contemplate!

Another statue redolent of the late 19th century is that of La Charité, a woman holding a child in her arms (according to some, in the typical posture of a child suffering from diphtheria).



Jean-Baptiste Jupille next to his statue in the Pasteur Institute gardens, around 1913. Jupille was the second child to be vaccinated against rabies in 1885 and later became gatekeeper at the Institute.

It is the so-called “historic” building that lies at the heart of the Institute. Built thanks to the public subscription initiated by the Académie des Sciences, to which we will return later, this building at 25, rue du Docteur-Roux houses the former apartments in which Pasteur lived out his final years and which now form the Pasteur Museum. Steeped in the atmosphere of the late 19th century, the museum enchants visitors and enthuses historians; it is one of the very few houses of its period to have remained relatively unaltered: items of furniture, eclectic in style, an imitation Henri II sideboard, heavy velvet curtains and period wallpaper are the hallmark of an era that combined a taste for the dark and lugubrious with a horror of unfilled space, but the heating vents or the gas heating system in the bathroom indicate a level of modern comfort unusual for the period.

The laboratories adjoin the apartments: Pasteur would make no new discoveries here, as he only took up residence towards the end of his dazzling scientific career, but from here he would run the Institute, assisted by five department heads and in close proximity to his colleagues. A remarkably practical man, Pasteur wanted the Institute to be a place of work where air, light and heat abounded. He took a close interest in the plans for the house, in the apartments required for the lab technicians and for the scientists (“for Chamberland and Roux, lab technicians’ rooms”).

The aim here is not a comprehensive tour of the Institute, but an introduction to some of its more symbolic spots: the crypt, the Salle des Actes (Assembly Hall), the hospital greenhouse, the Scientific Information Center, the Museum Gallery.

The Crypt: Pasteur Remembered

The most symbolic place of all to begin a visit to the Pasteur Institute can only be the crypt in which Louis Pasteur is interred.

After his death on September 28th, 1895, the founder and guiding spirit of the Institute was finally laid to rest here at the end of 1896; following a lavish state funeral, Pasteur’s coffin lay in the cathedral of Notre-Dame de Paris for the year it took to build this chapel, startling by its presence at the heart of this secular cloister. This despite the fact that many Pasteurians, and certainly some of the most famous amongst them such as André Lwoff, disputed Pasteur’s adherence to the Catholic religion, albeit with little evidence.



View of the crypt. Pasteur's tomb is at the center.

The French government wanted Pasteur interred in the Panthéon, which would have been perfectly logical for this “benefactor of humanity,” but his family preferred to bury him at the heart of his Institute, the chapel being literally in the midst of the laboratories, thereby investing the Institute with the task of perpetuating the memory of its founder and continuing his mission.

At its meeting on December 16th, 1896, the Board of Directors reported the words of René Valléry-Radot, Pasteur's son-in-law, indicating that “the family would hand over the vault it had built to the President of the Board of Directors of the Pasteur Institute and would entrust its care to Pasteur's students, present and future.” The family even paid for the cost of the work. Pasteur's son commissioned the decoration from an architect friend, Charles-Louis Girault, winner of the Grand Prix de Rome, and the mosaicist Auguste Guilbert-Martin, who took his inspiration from Byzantine mosaic art. The result is an extraordinary chapel, reminiscent of the churches of Ravenna, richly decorated with motifs symbolizing Pasteur's work, and described by novelist Louis-Ferdinand Céline in his *Journey to the End of the Night* as “a bourgeoiso-byzantine fantasy in the best taste”!

Encircled by laurels, the symbols of glory, and poppies, symbols of eternal rest, a splendid phrase taken from Pasteur's inaugural address to the Académie Française greets the visitor:

Blessed is he who carries within himself a God, an ideal of beauty, and who obeys it; an ideal of art, an ideal of science, an ideal of country, an ideal of the virtues of the Gospel.

Next the visitor encounters the young shepherd Jupille, grappling with a rabid dog. A frieze of grapevines and mulberry leaves representing Pasteur's work on wine and on silkworms is followed further along by chickens and sheep (evoking his work on cholera and anthrax). Carved on two large panels on either side of the sober yet impressive Swedish granite sarcophagus, like the victories commemorated on the Arc de Triomphe, figure the key phases and great triumphs of his work, from molecular asymmetry to the rabies vaccine.

Finally, in the apse at the foot of the altar lies the tomb of Pasteur's wife, who died in 1910, with the death masks of Pasteur and Dr. Roux. The vaulted ceiling bears depictions of the three theological virtues, Faith, Hope, and Charity, accompanied by Science, which is fitting given that the late 19th century was the age of science triumphant.

Was Pasteur a man of faith, a believer? André Lwoff disputed the idea, on the basis of a statement by Olga Mechnikov, who reported to him a conversation – to which there were no witnesses– she had had with Pasteur. It is not a question of “appropriating” him for religion, which would be meaningless, but simply of adhering to the facts. While Pasteur certainly maintained a complete separation between his personal practice and his professional life, which was perfectly acceptable, does this give any grounds for concluding that he was not a believer? There is no need for resounding speeches to attest to his Catholic faith. Appearances, in any case, do not suggest that Pasteur was anticlerical: his children were enrolled in religious schools, he died comforted by the sacraments of the Church, was interred in Notre-Dame, his family took good care to build a chapel in his name, and so on. From his inaugural address to the Académie Française on April 27th, 1882, it is clear that he did not share the positivistic doctrine illustrated by Auguste Comte or Ernest Renan: he declared himself happy to have served the spiritualist doctrine through his work on spontaneous generation (“In proving that, until this very day, life has never been shown to man as a product of the forces that govern matter, I have been of service to the spiritual doctrine.”) and was at pains to point

out that he did not share the positivistic philosophy of Emile Littré, whom he was replacing.

In any event, the crypt is an amazing place and never fails to take visitors by surprise. It is here that, every year, on September 28th, the staff of the Institute are invited to pay their respects. They no longer file past the members of the Institute's senior management, as if before the family of the deceased, as was the practice until the 1980s, but are invited to bow their heads before Pasteur's tomb. Here, too, is where for many years the nuns of the hospital would attend Mass, until the death of Pasteur's grandson. A final Mass was said here in January 2000, to allow the sisters of the order, who were leaving the hospital for the last time, to attend a service held at nightfall, in an atmosphere worthy of the early Christians.



Inauguration of the Pasteur Institute in Paris, November 14th, 1888.

The Salle des Actes (Assembly Hall) and the Creation of the Pasteur Institute

Returning from the crypt to the ground floor of the Museum brings you to the Salle des Actes (originally the Grande Bibliothèque, or main library), a magnificent room, square in shape, with nine windows, where all the great events in the life of the Institute unfolded between 1888 and 1995. It was in this room that the Pasteur Institute was inaugurated on November 14th, 1888 by French President Sadi Carnot, before an audience made up of the highest authorities of the State and countless eminent figures, both French and foreign: the Grand Dukes of Russia, the Italian and Turkish ambassadors, a delegation of foreign doctors, Mechnikov, Gamaleia, Bujwid. The future Queen of Portugal (born Amélie d'Orléans) had arrived just that morning. Too exhausted to deliver his speech himself, Pasteur had his son Jean-Baptiste read it to the gathered assembly:

And here we see it finished, this grand building of which it may be truly said that there is not a single stone that is not the sign of a generous thought. All the virtues have paid tribute towards the erection of this unique working place. Alas, I feel the poignant melancholy of entering it as a man 'vanquished by time.'

The mission of the Institute was clearly spelled out: Pasteur wanted his Institute "to be a dispensary for the treatment of rabies, a center for research into infectious diseases and a center for education in microbial research," which it has remained to this day.

How was the creation of the Pasteur Institute made possible? Obviously, it was thanks to rabies. But it was the generosity of the public that paid for its construction, since the subscription raised 2.5 million gold francs (the equivalent in today's terms of 8 to 9 million euros). Tribute was paid to the leading illustrious donors on the day of the inauguration: busts of Alexander III, Tsar of Russia, and of Don Pedro II, Emperor of Brazil, were placed in prominent positions, at the request of Pasteur himself. Others would follow: Madame Boucicaut, owner of the Bon Marché department store, Alphonse de Rothschild, Madame Furtado-Heine and the Comte de Laubespin. The latter was the first donor, sending Pasteur the "considerable sum of 40,000 francs" as early as January 1886. Politician and philanthropist, loyal supporter of the d'Orléans family, the Comte de Laubespin was a native of the same region of France as Pasteur (Franche-Comté) and was anxious to show his support for Pasteur, whom he greatly admired, in the final years of his life.

The extremely wealthy Madame Boucicaut had received a visit from Louis Pasteur, anxious to set before her the financial needs of the Institute and solicit her support. The visit is recorded in Jules Renard's *Journal*, as recounted to him by Lucien Guitry.

The passage warrants being quoted in full.

Pasteur presented himself at the home of Madame Boucicaut, owner of the Bon Marché department store. There was some doubt over whether he should be admitted. "It is an elderly gentleman," reported the maid. "Is that Pasteur, the rabies man?" The maid went to enquire. "Yes," replied Pasteur. He was ushered in. He explained that he wished to found an institute. Little by little, he grew more animated, expressing himself clearly and eloquently. "Which is why I have set myself the task of importuning charitable persons such as yourself. Even one penny..."

"Indeed!" exclaimed Madame Boucicaut, equally as embarrassed as Pasteur. Words proved inadequate. She took out a checkbook, wrote out and signed a check and handed it, folded, to Pasteur. "My thanks, Madame," said he, "you are too kind." He glanced at the check and burst into sobs. She followed suit. The check was for a million francs."

"Guitry's eyes were red, I had a lump in my throat," added Jules Renard. The anecdote itself is true, even if Guitry, with his sense of the theatrical, had grossly inflated the amount of the check, which was nevertheless for the not inconsiderable sum of 150,000 gold francs.

In addition to the busts of these original donors, the visitor is welcomed by a selection of "the family's" paintings: Roux, Duclaux and Mechnikov. The last could even be said to be present "in person" in the Salle des Actes, since the urn containing his ashes stands on top of one of the display cases, a reminder of the originality and humor of the Russian scientist, who wanted to spend his eternal rest surrounded by researchers.

The Hospital Greenhouse and the Practice of Medicine

On the other side of rue du Docteur-Roux stands the northern section of the campus, where the Institute's second building was built in 1900. In 1897, the Baronne de Hirsch had promised a donation of 2 million gold francs, and wished to meet the director to ensure he would put the money to the best possible use. Duclaux and Roux suggested buying the land opposite the historic building to build an annex devoted to chemistry.



The sisters of Saint-Joseph de Cluny in the gardens of the Hôpital Pasteur.

Behind this building lies the magical spot, hidden from the view of neighbors, of the hospital greenhouse, a winter garden housing tropical plants that links the two pavilions dedicated respectively to Emile Roux, the founder of the hospital, and Louis Martin, its first Chief Medical Officer.

This is probably the most charming spot of the entire Institute, and the most evocative of the atmosphere of 1900, especially as the inner courtyard with its round lamps and park benches retains all its antiquated charm. It would be easy to picture passing by the white-clad serene figures of the sisters of Saint-Joseph de Cluny who, for a century, devotedly nursed the sick hospitalized within these reassuring walls.

In the wake of the Budapest Congress, at which Dr. Roux had demonstrated the effectiveness of the fight against cholera, a woman unknown to him approached him and offered to fund the construction and maintenance of a hospital dedicated to the treatment of microbial diseases using the new Pasteurian methods.



The Hôpital Pasteur and its hospital unit, with treatments being dispensed by the nursing sisters, including Sister Godrick (foreground). Photograph taken in the hospital pavilion—now known as the “Emile Roux wing”—around 1910.

This was Madame Lebaudy, wife of the great sugar magnate. A whimsical and eccentric character who was keen to remain anonymous, she would arrange to meet the director of the Pasteur Institute beneath the Arc de Triomphe or on the Champ-de-Mars, in the teeth of the wind, to hand over

in cash the sums needed to purchase the land and then to build the hospital.

It was not until after her death in 1917 that Dr. Roux revealed this benefactor's identity. In 1926, Madame Lebaudy's bust was put on display in the greenhouse and in the 1960s, when sufficient time was deemed to have passed, her name was added to the bust.

In 1900, Dr. Roux launched the construction of the Hôpital Pasteur and introduced free medical consultations. Unlike other hospital services, where communal wards were the rule, patients here each had their own room and an ingenious traffic system provided maximum protection against the possibilities of contagion; staff entered each patient's room or "cell" from a corridor and exited via the balcony, thereby breaking the microbial chain from one room to the next; nurses were required to work bare-armed, floors were designed to be easily cleaned, etc.

In applying the Pasteurian rules of hygiene and asepsis, the Hôpital Pasteur became a pioneer in the field and remained so. The first epidemic of legionellosis (Legionnaire's disease) to break out when the Georges-Pompidou European Hospital opened in 2001 caused smiles amongst the staff of the Hôpital Pasteur, who had not experienced a single contamination in a hundred years...

As Dr. Claude Lapresle, a former Chief Medical Officer, wrote, the hospital was also the birthplace of a second great medical revolution: the development of antimicrobial chemotherapy. Famous patients including François Mauriac and Romain Gary came here for treatment and greatly appreciated this peaceful haven. It should also be added that, until 1940, patients were treated free of charge. The very soul of the hospital, for the century of its existence, was the sisters of Saint-Joseph de Cluny. Louis Martin, appointed by Dr. Roux to manage the hospital, had turned to the order to provide him with nursing staff that he could train in the rules of strict asepsis. Permission had to be sought from Rome for the sisters' sleeves and skirts to be shortened by a few centimeters, in the interests of hygiene. The hospital thus opened in 1900 with 15 nursing sisters, including the legendary Sister Laure, who died in 1984 at the age of 104. The daughter of a family of Breton farmers, she joined the order of Saint-Joseph de Cluny at the age of 20 because she wanted to become a missionary; instead, she spent her entire "career" at the Hôpital Pasteur until the age of 80, performing everything from the humblest to the most

delicate of tasks. In her diary, written straight from the heart, Sister Laure relates her life at the hospital, the fitting out of the first pavilion, where the sisters had to furnish the rooms and even make the mattresses, and her run-ins with violent patients (one hysterical male patient actually tried to strangle her!).

In the beginning, there were only the sisters to cover all the services, and we were also assigned some trainees. Among them, I remember, were some sisters of Saint-Vincent-de-Paul. They had to remove their elaborate headgear, known as the “cornette,” at the request of Mr. Martin, who was relentless in banishing anything that could spread microbes! Once we were installed, the first patients arrived: cases of scarlet fever, smallpox, diphtheria. The diphtheria cases caused us a lot of concern. Mr. Martin administered the anti-diphtheria serum and had to perform tracheotomies on children. It was awful, it required great dexterity and the patients had to be watched very carefully. Many recovered. Then all the other contagious diseases started arriving, rabies⁴ for example.

We received a month’s training, in rue Méchain, from Mother Anne-Marie and Mother Catherine, and other nursing sisters. Mr. Martin gave us lectures and, once we started work in the hospital, he continued to give us weekly training. He was extremely attentive to the way we performed our work. Very demanding. We were committed to applying the strict rules we had been taught.

Thanks to these precautions, we practically never had any contamination. We worked very hard at the hospital. It was tough. But we had a motto: “We’ll try.” Finally, with the grace of God, I succeeded. But the life of the community was happy, and a great support.

Sister Laure proved an attentive and dedicated nurse to Dr. Roux, whose fragile health led to his moving into the hospital in 1916, on the 2nd floor. He remained there until his death in 1933, under the experienced care of Sister Laure. She wrote:

At first, he made a strong impression on me. He was cold, never spoke. We didn’t know what to do with him. We had to try and get him to speak, and after that things went better... He was a good and a simple man. He had nothing but his pension from the Institute to live on and yet he gave away his money to the poor... Yes, I always admired the generosity and the rectitude of this man, completely dedicated to his task.

In recognition of her services to the Hôpital Pasteur and to the Pasteur Institute, Sister Laure was awarded the Légion d’Honneur. On her 100th birthday, President Valéry Giscard d’Estaing came in person to the

Institute to present her with the insignia of Officier de la Légion d'Honneur, at a ceremony held in the greenhouse.



On April 30th, 1980, to mark Sister Laure's 100th birthday, President Valéry Giscard d'Estaing invested her with the cross of Officier de la Légion d'Honneur. The oldest of the sisters of Saint-Joseph de Cluny, Sister Laure had worked with Dr. Roux since the opening of the Hôpital Pasteur in 1900.

Through the patients they tended, this tireless and spirited religious community witnessed a century of changes in public health. Smallpox, scarlet fever, diphtheria, typhus and rabies patients were followed by those suffering from tuberculosis and, later, from AIDS.

The sudden emergence of this terrible disease caused great upheaval in the life of the hospital: seriously ill patients requiring constant care, the irruption into the previously tranquil world of the hospital of friends of the patients, homosexuals and drug addicts among them, the parents of patients, discovering for the first time that their children were homosexual, not to mention a mortuary that was sometimes called into service several times a week. The entire hospital staff, supported and energized by the sisters, and under the auspices of the admirable general supervisor Sister Damien, a marvel of discretion and efficiency, responded remarkably in offering comfort and humanity to both patients and their families.

The closure of the hospital on December 31st, 1999, was thus a very painful time for the staff. The Regional Hospital Agency for the Paris region wanted to reduce the number of beds in the south of Paris, and proceeded to close three hospitals, Broussais, Laennec and Pasteur: the beds from Pasteur were transferred to the Hôpital Necker, to a department now known as “Pasteur-Necker,” while the Pasteur Institute retained the consultation and vaccination department. The religious community left the hospital and, in the absence of both nuns and patients, the Institute had little option but to close the chapel. The management of the Institute approached Cardinal Lustiger, Archbishop of Paris, for authorization to deconsecrate the chapel and turn it into a meeting room, to be known as the Salle Saint-Joseph de Cluny in memory of the sisters of the order. A final Mass was said there on January 17th, 2003, by Monseigneur Patrick Le Gal, then Bishop of the armed forces, before a small congregation that included the President of the Pasteur Institute, bringing a long history to a close.

Nor had the hospital been spared its share of tragedy: Eugène Wollman was arrested there prior to being deported to Auschwitz, from whence he never returned. Elie Wollman’s deep-seated attachment to the hospital was largely due to this tragic disappearance, which no doubt explained the heavy atmosphere that apparently reigned at the Pasteur Institute in the post-war period, fed by tensions between former Resistance members and former collaborators.

Fortunately, the greenhouse has also been the scene of much happier events, such as the decoration of Sister Laure or, in 1990, the visit by the wives of heads of State and Government attending the Paris meeting of the Conference on Security and Co-operation in Europe.

The Scientific Information Center and the Duchess of Windsor

A little further and we come to the Scientific Information Center (CIS) built thanks to the bequest of the Duchess of Windsor and inaugurated on September 28th, 1994 by Prime Minister Edouard Balladur. The architects designed a fine building that houses a 500-seat auditorium, the library, and more recently the Institute's management. Polished concrete blends harmoniously with light-colored wood and large window bays to offer a vast, light-filled space ideally suited to scientific meetings and to the calm of reading and reflection. This is now the venue for major events in the life of the Institute, such as the closing ceremony of Pasteur Year on September 28th, 1995, attended by President Jacques Chirac and Federico Mayor, Director-General of UNESCO, or the celebration of the Nobel Prize awarded to Luc Montagnier and Françoise Barré-Sinoussi in October 2008.

The building, which provides a venue for a multitude of conferences and events both internal and external to the Pasteur Institute, pays tribute to the Duchess of Windsor since much of her bequest, which we will discuss in more detail later, was used on its construction. The superb photograph of her taken by Man Ray has been “digitized” to represent the IT networks that run through the building.

The Museum Gallery where Donors, Scientists, and Famous Figures Meet

Let us return to the historic building, which houses the Pasteur apartment (Musée Pasteur) previously mentioned, and where a gallery honors prominent donors and scientists of the Institute. At the entrance to the gallery, which has played host to countless official figures, heads of State, crowned heads and more, are listed the names of the most generous benefactors of the Pasteur Institute since its founding, from the subscriptions of 1886 and 1894, right down to the present day. Their support has enabled the Institute to develop, and the list is updated every two years to pay tribute to these generous donors.



The Scientific Information Center was inaugurated on September 28th 1994 by Edouard Balladur, then Prime Minister. This building includes the multimedia library, scientific computing, an auditorium, a conference area, and the archives.

A number of leading scientific figures are also represented in the gallery, including two Nobel laureates: Jules Bordet, founder of so-called “humoral” immunology, and Alphonse Laveran, who discovered the role of protozoa in disease, in particular the agent responsible for malaria. They are accompanied by Jean Cantacuzène, and by Eugène and Elisabeth Wollman.

Jean Cantacuzène, a young Romanian doctor, came to the Pasteur Institute to train and, after returning to his home country, in 1920 he founded an institute that bears his name. This was a period when many Romanians

came to Paris to complete their training, forging close links with Pasteur in particular.

Further along, a medallion commemorates Eugène and Elisabeth Wollman (the parents of Elie Wollman), who made a profound impact on the Institute. Born in Belarus, Eugène Wollman left to study in Liège and was welcomed by Mechnikov to the Pasteur Institute in 1909. He was appointed head of department and, with his wife, carried out his most vital research on bacteriophages and lysogenic bacteria, a ground-breaking subject that was to have major importance for the later work done by his son, Elie, and by François Jacob, on the regulation of gene expression. This brilliant and highly promising scientific career was brought to a sudden halt: Eugène Wollman was arrested in December 1943 in his room at the Hôpital Pasteur where he had taken refuge following the arrest of his wife a week earlier (according to some accounts, they were probably denounced by one of their colleagues). Both were taken to the Drancy camp and then to Auschwitz. Neither returned.

Finally, a photo gallery at the entrance to the Museum recalls the famous figures that have visited the Institute over the years. The entire world is represented here.

To give the honor where honor is due, many a French President has also set foot inside the Pasteur Institute. It was Sadi Carnot who inaugurated the Institute, on November 14th, 1888.

In 1913, Poincaré presided over the Institute's 25th anniversary festivities, welcomed by Dr. Roux, followed by Alexandre Millerand in 1922, in celebration of the centenary of Pasteur's birth. After the Second World War, Vincent Auriol paid a visit on December 16th, 1947. In more recent times, Valéry Giscard d'Estaing, François Mitterrand, Jacques Chirac and François Hollande have all made their way here on important occasions, including the Institute's centenary in 1987 and The Year of Louis Pasteur in 1995. Presidents and Prime Ministers have even sat on its Board of Directors, which would seem somewhat out of place these days! Poincaré was elected to the Board in 1911, Antoine Pinay in 1953 (continuing to serve until 1966), and Paul Reynaud in 1961.

Many crowned heads have also honored the Institute with their presence, starting with the future Queen of Portugal (one of whose ladies in waiting had taken the veil with the order of Saint-Joseph de Cluny), Queen Marie

of Romania in 1924, the Emperor of Ethiopia, Haile Selassie, in 1954, in the time of Jacques Tréfouël and Pasteur Vallery-Radot, Grand Duchess of Luxembourg Joséphine-Charlotte in 1978 and, in 1980, King Carl-Gustav of Sweden and Queen Silvia, following a conference on biotechnology organized by the Directorate-General for Scientific and Technical Research (DGRST).

In the 1990s, the Pasteur Institute often appeared on the schedule of visits organized by the Protocol Department of the Ministry of Foreign Affairs. It was one such visit that brought Diana, Princess of Wales, to rue du Docteur-Roux on her first official visit to Paris, accompanying Prince Charles, on November 11th, 1988, to visit the laboratory of Professor Luc Montagnier and the hospital. It was no easy task to rein in the journalists as they rushed up and down the narrow corridors of the laboratory, or to prevent collisions!



Her Royal Highness Diana, Princess of Wales, visits Professor Luc Montagnier's laboratory on her first official visit to Paris, November 11th, 1988.

Different prince, different style: Felipe de Bourbon, then Prince of Asturias and heir apparent to the throne of Spain, also paid a visit to the Institute and the laboratory headed by Luc Montagnier, now a media star by virtue of his discovery of the AIDS virus. The imposing height of the

young prince (1.97 meters, just over 6ft. 4in) in no way prevented him from thoroughly enjoying meeting the Spanish students at the Institute that day.

The Comtesse de Paris, great granddaughter of the Emperor of Brazil, visited the Pasteur Institute in September 1994. She had been raised by her Orléans-Braganza family to honor and respect Pasteur (Don Pedro showed great friendship for the scientist, as we will discover) and also agreed to act as hostess, accompanied by her daughter Princess Chantal and her grandson Jean, Prince d'Orléans, at a Brazilian evening held on behalf of the Pasteur Institute in the Orangery of the Château de Versailles on September 28th, 2002. Brazilian exuberance and the baroque style of the Grand Siècle proved the perfect match.



Felipe de Bourbon, Prince of Asturias, visits the Institute and Luc Montagnier's laboratory, September 30th, 1996.

On June 28th, 2010, it was the turn of His Serene Highness Prince Albert II de Monaco to visit, eager to establish a partnership between the Principality and the Pasteur Institute.

Many overseas Heads of State and their wives, particularly from Africa – Gabon, Zimbabwe, Djibouti, Burkina Faso, the Republic of Mali, for example – spoke of the difficulties encountered by their respective countries, mostly linked in large part to AIDS. The visit by President Bongo of Gabon proved unusual: he refused to sign the visitors' book, delegating the task to his aide de camp, and ordered his Prime Minister to ensure that Gabonese trainees should be sent to the Pasteur Institute.

Prince Talal bin Abdulaziz al-Saud, brother of King Fahd of Saudi Arabia and a frequent donor to the Pasteur Institute, paid a visit on November 27th, 1985 to present a check for 1 million francs in the name of the Arab Gulf Program for United Nations Development.



Visit by the wives of Heads of State and Government of the CSCE, November 20th, 1990, Raissa Gorbachev, Barbara Bush, and Danielle Mitterrand.

In November 1990, a key visit brought together the wives of the Heads of State and Government attending the Conference on Security and Cooperation in Europe (CSCE), including Barbara Bush, Raissa Gorbachev and some 20 others, accompanied by Danielle Mitterrand, who strolled around the campus, from the Museum to Professor Montagnier's laboratory⁵. This clearly confirmed the renown of the Pasteur Institute.

In another vein, the Institute even attracted attention from the world of show business, from Elizabeth Taylor to Jane Birkin, by way of Arlety, accompanied by Douglas Fairbanks Jr., who visited in 1989 and made over to the Institute the rights to her fragrance, *Atmosphère*. AIDS was the main reason for the generosity of the show-biz world: Line Renaud was the first in France to come forward in support of performing artists suffering from AIDS, and came to me to ask how she could help the Institute in this area. She was followed by a group of artists, inspired by Etienne Daho, accompanied by Jane Birkin and Françoise Hardy in particular, who made over to the Institute the proceeds of a recording, *Urgence: 27 artistes pour la recherche contre le sida* (Emergency: 27 performers on behalf of AIDS research).

In April 2014, Bill Gates, founder of Microsoft and of the Bill & Melinda Gates Foundation, visited the Pasteur Institute to attend a conference on tropical diseases organized by the foundation.

Our stroll through Pasteur's world has served as an introduction. These walls, steeped in the memories of the first "Pasteurians" have seen the history of France's greatest medical research institute unfold. Now let us see how Pasteur's work culminated in the creation of the Pasteur Institute and how his successors, in turn, brilliantly pursued the path to further discoveries.

PASTEUR'S MAJOR CONTRIBUTIONS TO THE HISTORY OF SCIENCE AND OF MEDICINE

“His immense practical skill in converting theoretical knowledge into technological processes made him one of the most effective men of his century: he synthesized the known facts of biology and biochemistry into original concepts of fermentation and disease and thus creating a new science which dealt with pressing needs of his social environment.”

René Dubos, *Louis Pasteur, Free Lance of Science*,
A Da Capo Paperback, 1960.

The sheer power of the image Louis Pasteur left on people's minds is the measure of the disruptive change he brought to science and medicine.

It is sometimes difficult nowadays to realize the phenomenal revolution his discoveries represented. How do you explain, for example, to young people who have all been vaccinated and who have seen men walk on the moon, what it meant at the end of the 19th century to overcome rabies or to restore to health the cultivation of grapes and the raising of silkworms, and thereby save the entire wine and silk industries of France?

At the time, these were considerable successes: for the brewers and wine-makers unable to maintain the quality of their production, pasteurization came to the rescue, and they were obviously immensely grateful to Pasteur. Silkworm farmers in the Gard department despaired as two diseases, pebrine and flacherie, ravaged their stock and threatened their ruin. After months of unremitting work and observation, Pasteur provided them with both the key to the mystery (both diseases were caused by micro-organisms) and the solution (the cellular egg production method, which prevented contamination and transmission to future generations): the silk farming industry was saved!⁶ Through his research into silkworm diseases, he discovered infectious agents and revealed how these diseases were transmitted via contagion and by heredity. Pasteur transposed these findings onto the human body and asserted that each disease had its corresponding microbe. In so doing, he opened wide the gateway to conquering infectious diseases. Until then, nothing was known of their causes, and the mysterious agent responsible for infectious diseases was

seen as an anonymous killer, forever resisting all identification. Pasteur's discoveries led mankind into a new world that had nothing in common with the old. "After Pasteur, not only the world of science and the world of health were never the same, but the whole world," wrote Claire Salomon-Bayet.

Everything really began, however, on July 6th, 1885 at the Ecole Normale Supérieure, rue d'Ulm. A young boy from Alsace, Joseph Meister, who had just been savagely bitten by a rabid dog, was brought by his parents to Pasteur, who decided to administer the anti-rabies vaccine he had prepared, as the child was otherwise certain to die. The success of this first vaccination against rabies, performed by Dr. Grancher since Pasteur was not qualified as a physician, was widely reported. Pasteur, of course, was already a famous figure. His masterly demonstration that spontaneous generation was a myth and his contentious debates with Pouchet on the subject had confirmed his authority and scientific rigor. He had saved the brewers and grape-growers thanks to "pasteurization," and the silk farmers with his work on silkworm diseases, thus giving birth to a new scientific discipline: microbiology. With the cure of Joseph Meister, however, Pasteur's reputation scaled new heights and his renown became universal. It is hard for us today to imagine the effect that the disease had on the minds of those living in the late 19th century. Common in many countries, the disease was not particularly widespread in France, but the horrendous nature of its progression and the inevitability of its consequences ranked it alongside plague, as one of the century's greatest fears and brought massive prestige to the man who defeated it.

Eight months later, on March 1st, 1886, Pasteur announced to his colleagues in the Académie des Sciences that "this is the start of post-exposure rabies prophylaxis," and the Académie des Sciences decided to launch a subscription to fund the construction of an institute where Pasteur could continue his work. There was a huge national and even international response. The list of donors appeared regularly in the legal gazette, the *Journal Officiel*, and included every social class: a postman, notaries, errand boys, soldiers, gendarmes from a small brigade in the Jura, high school principals, building caretakers, Prefects and more. The list is endless and astonishing, not to mention the illustrious foreigners to whom we shall return. What other French institution could lay claim to such a birth certificate?



“An inoculation under the eye of Mr. Pasteur” by L. Le Riverend and F. Dochy (*La République Illustrée*, April 3rd, 1886). The illustration shows the young Jupille being vaccinated under the supervision of Louis Pasteur (in the background).

Pasteur’s reputation attracted some extraordinary correspondence, of which we will quote two examples here, taken from the collections of the Pasteur Museum. The first is quoted in French since it is difficult to translate!

Monsieur le médecin, j’ai aprî que vous aviez vainqu’ut la mort. On dit que c’est gratis. On dit aussi que vous faites des apranti medecin si vous voulez pas m’aprendre medecin vous m’aprendrer solement a faire la guerison de la rage.

And the second:

Most illustrious master,

Were it not that I fear to be indiscreet, I would go so far as to inquire whether your Institute – for which I am prepared to disburse a considerable sum (I am generous in my gratitude) – admits mothers-in law. I require a special and spacious pavilion for them, for of all the classes of the Rabid, they are certainly the most numerous. In the hope of a favorable reply, I beg you to accept, illustrious master, the most respectful salutations of a son-in-law driven to madness by his mother-in-law.

Envelopes bearing the most extraordinary inscriptions also landed on his desk, such as one marked simply,

To the man who works miracles.
Rue d'Ulm

And another from a doctor applying for a position:

The home of the physician who defeated death.
I can express myself in no other way.

The personal disinterestedness of the learned man, the lofty nature of his speech, his deep-seated commitment to the cause of those who suffer, soon made him, as we see, a secular saint, gifted with an extraordinary talent as a communicator, and who did not reject the aura of glory that surrounded him. His family, his wife in particular and also his son-in-law, contributed actively to nurturing the cult of the great man.

Madame Pasteur proved to be a constant companion and exemplary colleague: she wrote the letters and articles he dictated and followed the progress of her husband's work. René Vallery-Radot wrote of her that: "Madame Pasteur was able, from the very first, not only to accept but even to agree that the laboratory came before all else." She turned her salon in rue Dutot into a shrine to the glory of Pasteur (decorations and lavish gifts were prominently displayed), agreed to the government's proposal to organize a grandiose State funeral, and interred her husband in an extraordinary crypt.⁷ For his part, Pasteur's son-in-law, René Vallery-Radot, penned a biography of his father-in-law in 1900 that was pure hagiography.

A number of keynote events left their mark on public opinion, such as Pasteur's jubilee, held at the Sorbonne to mark his 70th birthday, on the initiative of scientists from overseas,⁸ the State funeral that followed his

death – the catafalque was borne through the streets of Paris from rue Dutot to Notre-Dame for an impressive ceremony.

Then the primary education curriculum adopted the legend of Pasteur and instilled admiration and respect for the man of science in each successive generation of French children under the Third Republic.

The name Pasteur was bestowed on hundreds and hundreds of streets, avenues, squares, primary schools and high schools, not only in France – the numbers are beyond count – but around the world. It is the most widespread and the best-known French name outside France. Examples include a stained-glass window in Washington Cathedral or at the University of Pittsburgh, a statue in a square in Buenos Aires, the Avenue Louis-Pasteur in Boston, the Louis Pasteur Elementary School in Chicago or Detroit, etc.



Louis Pasteur surrounded by “bitten” children vaccinated against rabies – probably Russian children who accompanied Dr. Voinov in May 1886 – at the Ecole Normale Supérieure, in 1886.

Many people abroad developed a positive veneration for Pasteur, from Japan to the United States. It might surprise you to know that Pasteur’s personal library, an outstanding collection that was put up for sale by the

widow of his grandson, is now in California, in the Huntington Library, San Marino, California, thanks to determined purchases by a collector with a passion for the history of science, Bern Dibner, a Ukrainian émigré to the United States.⁹



Louis Pasteur in his study, about 1892.

SCIENCE AT THE PASTEUR INSTITUTE

“Research is unpredictable. It is for us to do our utmost to ensure that, tomorrow as yesterday and today, the Pasteur Institute continues to play its part in this great adventure of humanity’s, and that it continues to lead the field.”

François Jacob, 1987.

The Birth of Microbiology and Immunology

When the Institute opened in 1888, microbiology and immunology began. Even the term “microbe” was recent coinage: Sédillot had employed it for the first time at the Académie de Médecine in 1878. There are no sudden breaks in science; each step forward emerges out of the last; it was Davaine who gave the first demonstration of the pathogenic action of a germ, in this case the bacterium responsible for anthrax, but his findings passed almost unnoticed. Koch and Pasteur picked up on his work, in what was truly the beginning of a new era. These two great figures stand out at the very center of an absolute explosion in discoveries of pathogenic agents in the late 19th century. First Pasteur, with the discovery of the sepsis vibrio, staphylococcus, streptococcus, pneumococcus, swine erysipelas, then vaccines against chicken cholera, anthrax and rabies. Koch, meanwhile, had discovered the tuberculosis bacillus and the cholera vibrio, and founded the first school of bacteriology. Each had his students and the war of 1870 between these two countries prompted the French and German teams to vie more eagerly with one another in terms of commitment and inventiveness.

Microbiologists got very excited as more and more bacteria were discovered. And, as Albert Delaunay wrote, “we can safely say that in 1914, barring the few new germs that would be discovered during the war, the etiology of all the major human or animal diseases was now known¹⁰.” This was a considerable step forward in a very short space of time, given that in the mid 19th century still, nothing at all was known of the causes of disease. Not all were discovered at the Pasteur Institute, but all were studied here. Success breeds success, and brilliant young scientists

flocked to Pasteur, instantly winning for the new Institute a prominent position in the landscape of medical research in Paris.

Another new field of science also caused great excitement: immunology. Mechnikov gathered numerous colleagues around himself, many of them Russian, naturally. His discovery of phagocytosis¹¹ in Messina in 1882 was far from universally accepted, and Mechnikov fought hard to establish his theory against those of the “humoralists,” who believed that the body’s natural defenses against microbes were provided by “humors,” essentially substances present in the blood and known as alexines. After much passionate debate that went on for several years, Bordet finally came to Mechnikov’s rescue with his discovery of the role of the “complement” in cellular agglutination.

The presence of the “bite victims” gave the Institute a special flavor of its own: they flooded in from everywhere, staying at a nearby hotel nicknamed the “Rabies Hotel”! The Institute was thus a very unusual place for its time, as it brought together people from very different horizons: doctors, chemists, physicians, veterinarians, physiologists, bacteriologists, etc., in what would later come to be known as “interdisciplinarity.” The range was wide. The real criterion for recruitment was undoubtedly the enthusiasm to engage in this new war on diseases that the “master” had inculcated in his disciples, and respect for the Pasteurian “method.”

The unbroken reign of Dr. Roux over a period of 30 years certainly left a profound mark on the Institute, particularly in the area of education. He taught his first class on March 15th, 1889. Surrounded by lab technicians whose names would later become famous in the biological disciplines, starting with Yersin and followed by Maurice and Charles Nicolle, Borrel, Sergent, etc., Roux taught the science that was currently being developed in his laboratory, combining theory with practical exercises. An outstanding teacher, Roux made an impression on entire generations of scientists; his course on Technical Microbiology gradually became known as “le grand cours” (the great course) and then “Roux’s course,” and his international fame went from strength to strength. Daunted by the professor’s piercing gaze and the quality of his demonstrations, his listeners dared not even applaud, so engrossed was he in his subject. This course long enjoyed a monopoly in the teaching of microbiology and immunology in higher education, joined in the 1960s by molecular biology, before teaching shifted to the universities.

By 1894, he had already accepted 26 students and over a hundred auditing students. This was the great year of serum therapy and people were flocking to the Institute to find out more, on the spot, about this miracle treatment for croup, a disease that posed such a threat to infants and young children. The students were, for the most part, physicians, but there were also directors of leading public health institutions among them.



The organic chemistry laboratory, around 1910: a discipline fundamental to the understanding and manipulation of the living world.

By 1914, over two thousand students had taken the “grand cours” since its introduction.¹²

In the first years after the Institute opened, it was the work of Roux, Martin and Chaillou that attracted attention: the antitoxin contained in the serum of horses could be used against a disease that caused ravages at the time, particularly amongst children: diphtheria. This sparked a new enthusiasm for the Pasteurians and *Le Figaro* launched another fund-raising drive in 1894, to build stables on the Villeneuve-l’Étang estate on the outskirts of Paris, and to purchase horses.



Scene showing the vaccination against rabies, attended by Jules Viala and Edouard Dujardin-Beaumetz, around 1910. At the back stands Jean-Baptiste Jupille, now gatekeeper of the Pasteur Institute.

Until 1914, as discovery followed discovery – the treatment for diphtheria, work on phagocytes and inflammation, identification of the plague bacillus, the role of fleas in the transmission of plague – the Pasteur Institute grew and was organized largely under the impetus of Dr. Roux: many new laboratories were created, plots of land adjoining the Institute were purchased in rue Dutot, rue de Vaugirard and rue des Volontaires, and the hospital was built in 1900. The massive Osiris bequest (36 million gold francs), which we will hear more about later, provided the Institute with the means of funding its operations and its expansion.

During the First World War, both research and teaching came to a halt and the Pasteur Institute would concentrate on producing serums and vaccines, at the request of the authorities and the armed forces health services, to combat not only tetanus and typhus but also dysentery, gangrene, etc.



The vaccine preparation laboratory headed by Félix d'Hérelle, around 1919.

The Institute made prodigious efforts, supplying over six million doses between August 1914 and November 1918, over half of which were handed over free of charge to the Allied forces and to the Assistance Publique health service. It also had a presence in the army's laboratories, where Dr. Roux was a frequent visitor, and where he met a number of generals such as de Castelnau and Mangin.

During this period, another Pasteurian, René Legroux, would prove particularly dynamic, setting up laboratories on the front line to carry out bacterial diagnoses, thereby preventing numerous epidemics, and revealing an extraordinary talent for organization. The Legroux "ambulances" were used to prepare equipment and produce the growth media necessary for diagnosing infectious diseases.

Calmette wrote:

During the four years of the war, Legroux knew no other home than his laboratory. He could be found there at any hour, day or night, ready to provide whatever information, technical advice or product might be needed. He quitted it only on short trips, either to the front or to some hospital away from the front that had asked for his assistance.

And Delaunay:

There was not a bacteriologist, French, English or American, who did not obtain from Legroux the most willing assistance, and who does not feel a great sense of gratitude towards him.¹³

It should be stressed that, without the vaccines and serums prepared by the Pasteur Institute, troop losses due to infectious diseases would have been much higher. Whether still back in Rue Dutot or with the Army of the Orient “immobilized by fever” (malaria), in the trenches of Verdun swept by diphtheria, at various points on the front line where Pasteurians operated makeshift laboratories, particularly to contend with the gases deployed by the Germans from 1915 onwards, or with cases of gangrene, the Pasteur Institute was truly present on all fronts and making its contribution to the defense of the nation.



Mobile bacteriological laboratories, also known as “Legroux ambulances.” Introduced by René Legroux, these ambulances were used in the French armed forces during the First World War, around 1916-1917.

In the years leading up to the Second World War, however, it was the work of Jacques and Thérèse Tréfouël, Federico Nitti and Daniel Bovet that attracted attention in the field of therapeutic chemistry: in addition to the discovery of the anti-infectious action of Prontosil by the German

researcher Domagk (for which he was awarded the Nobel Prize), the Pasteurian team showed that it was the “sulfonamide” component of the drug that was responsible for this action. The sulfonamides would first be tested experimentally at the Hôpital Pasteur, where they enjoyed their first clinical successes, paving the way for the use of antibiotics and marking the start of a revolution in medicine.

Molecular Biology and the Beginnings of Genetic Engineering

After the war, the Pasteur Institute extended the scope of its activities, but continued to study pathogens, bacteria, viruses, parasites and fungal infections. Virology became a branch in its own right, independent of microbiology, with the start of the initial research by Amédée Borrel and Constantin Levaditi. The division in the 1970s of the scientific journal *Les Annales de l'Institut Pasteur* into three sections, microbiology, virology and immunology, reflected the change, as did the splitting up of the “grand cours.”

One of the most important developments, however, took place during the 1950s. From this time forth, bacteria and viruses are studied not only as the agents of disease, but also because they provide access to a better knowledge of living systems. The double helix discovered by Watson and Crick in 1952-1953 paved the way for molecular biology, a field in which Pasteur Institute researchers – Lwoff, Monod, Jacob and Wollman – would prove brilliant pioneers. Paradoxically, this new direction received no support from Pasteur Institute management. In his book *Jeux et Combats*¹⁴, André Lwoff relates how the CNRS had proposed setting up, within the Pasteur Institute, an institute of molecular biology. The proposal was discussed at a meeting of the Board of Directors and “the verdict fell with devastating effect: molecular biology is not of interest to the Pasteur Institute!”¹⁵

It was nevertheless a brilliant period although it did, it must be said, divert the Institute away from its initial medical and public health concerns, and it attracted many overseas researchers, largely British and American at the time. (Martin Pollock, Seymour Benzer, Francis Crick and Sydney Brenner, for example, were among the British; Melvin Cohn, Salva Luria and Arthur Pardee among the Americans.) The group made up of Lwoff, Monod and Jacob became the leading lights of the Pasteur Institute. All three were exceptional personalities, scientifically and personally, and the

book that pays tribute to Jacques Monod, edited by Agnès Ullmann,¹⁶ accurately portrays the extraordinary excitement and enthusiasm they generated around them. “Messenger,” “operon,” “repressor,” “galactosidase,” “enzyme induction” were magical terms that haunted them day and night and gave them the sense of being part of a fabulous adventure. Martin Pollock, a Cambridge-trained biochemist, recalled the years of 1952-53 as the “Belle Epoque” of the Pasteur Institute, when he worked closely with Jacques Monod and jokingly described Monod’s overwhelming personality; “Do you ever feel, Jacques, that you are alone in the world? That the world consists in a way of you (on the one hand) and all the rest of humanity on the other?” From working under the eaves of the Institute, in what was henceforth known as “the attic,” ignored by the French authorities, essentially with the sole assistance of US foundations, the Pasteurian team suddenly emerged into the daylight when it won the Nobel Prize on October 13th, 1965.

From one moment to the next, the lives of the team’s members were turned upside down: acclaimed, questioned on every subject under the sun, in demand everywhere, they confronted the tidal wave of media attention with a swell of satisfaction, in the case of Jacques Monod, and with great reserve on the part of François Jacob, who protected himself as far as he possibly could and quite simply rejected most contacts with journalists.

François Gros, who was to succeed Jacques Monod as director of the Pasteur Institute, was another eminent figure of this great period for science, through his work on messenger RNA in cooperation with James Watson.

Monod and Jacob’s students went on to distinguish themselves: in 1970, Jean-Pierre Changeux discovered the acetylcholine receptor and Maxime Schwartz characterized a mechanism for the regulation of gene expression that differed from the one discovered by Jacob and Monod. In the late 1970s, the genetic engineering that had grown out of molecular biology was developing rapidly at the Pasteur Institute. Researchers were gradually managing to isolate a cell’s genes, to recombine DNA molecules, to reintroduce them into live cells and produce cultures from bacteria such as human growth hormone or insulin.



Left to right: François Jacob (1920-2013), Jacques Monod (1910-1976) and André Lwoff (1902-1994), three Noble laureates in medicine in 1965. Jacques Monod presents a set of dice illustrating the bases of symmetry in the allosteric model.

It was a revolution of obvious biomedical and industrial interest: Philippe Kourilsky and François Rougeon succeeded in the first cloning of complementary DNA (DNAc) and Pierre Tiollais, basing his ideas on the work of Hervé Maupas and Alain Rambach, used genetic engineering to develop a vaccine, Hevac B,¹⁷ against hepatitis B, which resulted in a significant reduction in production costs.

The Return of Infectious Diseases: AIDS

In the early 1980s, a hitherto unknown disease thrust the Pasteur Institute into a new era. Everyone remembers how AIDS first began cutting swathes through the San Francisco homosexual community and how doctors and researchers were baffled by a disease that afflicted sufferers with such different pathologies (*Pneumocystis* pneumonia, Kaposi's sarcoma, toxoplasmosis, etc.) with only one common feature: immunodeficiency and a shortage of lymphocytes. At the request of Dr. Willy Rozenbaum and his group of clinicians at the La Pitié-Salpêtrière hospital

in Paris, Jean-Claude Chermann and Françoise Barré-Sinoussi, both members of the team headed by Professor Luc Montagnier, head of the Viral Oncology Unit at the Pasteur Institute, turned their attention to studying the ganglia of an initial patient by the name of Bru. In January 1983, the team (essentially, Françoise Barré-Sinoussi) isolated for the first time a new virus that would be known as LAV (Lymphadenopathy Associated Virus), but whose involvement in AIDS had still to be demonstrated. By the end of 1983, the proof was available, and the LAV virus was qualified as the major agent in AIDS.

The scale of the disease, which spread rapidly and soon began to affect intravenous drug-users and hemophiliacs, the massive media coverage it attracted, the tragedy of the growing number of deaths and the dispute with Robert Gallo's team over who should claim credit for the discovery of the AIDS virus greatly enhanced the reputation of the Pasteur Institute, much to the satisfaction of Professor Montagnier, on whom the media heaped praise. Françoise Barré-Sinoussi, whose work had been key to the discovery, remained in the shadows with exemplary modesty.

In July 1984, the Pasteur Institute signed an agreement with US firm Genetic Systems to develop diagnostic testing kits. Perfectly within its rights, the Institute's management put up a staunch fight against the US government and won for the Pasteur team the recognition it merited but which, without the court battle, would have gone to the American team. All credit for this victory must go to Raymond Dedonder, President from 1982 to 1988, a warm, courageous man totally devoted to the Institute. His colleagues also have vivid memories of his moments of anger, as brief as a summer storm and instantly forgotten. His Presidency bore the marks of this difficult conflict, during which he demonstrated unflinching determination and dedication to defending the interests of the Pasteur Institute. "Pasteur Institute versus the government of the United States" was David against Goliath. An agreement was reached in March 1987, but awarded the Institute only part of the royalties to which it should have been entitled. A more equitable solution was reached subsequently in an agreement negotiated by Maxime Schwartz and signed in 1994.

A discovery of such importance to public health had a significant influence on the 1980s and 1990s. The Institute would have a new building constructed to house the AIDS and retroviruses department. Professor Montagnier had an office there (bigger than the President's!), which he was never to leave, contrary to the persistent rumor, never denied

by the Professor, that he would head for the USA as soon as he reached retirement age from the CNRS.¹⁸ Professor Montagnier was what is known in Pasteurian parlance as “bi-appartenant,” that is to say he held a position with the French scientific research council, CNRS, but actually worked at the Pasteur Institute. His retirement from the CNRS made no change to his status at the Pasteur Institute, where he continued to work until 2003.



Hubert Curien, minister of research and technology awards the great cross of the National Merit order in 1992 to Marcel Boiteux, chairman of the Pasteur Institute from 1988 to 1994.

The AIDS years were accompanied by an evolution in the perception of infectious diseases. The eradication of smallpox and the virtual disappearance of tuberculosis thanks to improved hygiene, had led many to believe that infectious diseases had gone for good.

The outbreak of this terrible pandemic, and the specific conditions of its transmission, made everyone aware of the contrary, and that a world free of infectious diseases was merely a dream. A few years later, this was only further confirmed by West Nile virus, the SARS epidemic in Hong Kong, and the return of tuberculosis.

Research across a Broad Biomedical Spectrum

While AIDS was much discussed in the media, the Pasteur Institute nevertheless pursued its research across a broad spectrum as other fields appeared or developed, using new and increasingly sophisticated technologies: genomics, for example, which has allowed the Institute to play an important role in the sequencing of micro-organisms (sequencing of *mycobacterium tuberculosis* by Stewart Cole in 1998, or the recent complete sequencing of the Zika virus gene at the Pasteur Institute of French Guiana). Another area was the epidemiology of infectious diseases, illustrated at the time of the outbreak of the chikungunya epidemic in the Indian Ocean (2006), when the Pasteur Institute rapidly tracked down the origin and evolution of the virus, or genetic susceptibility to infectious diseases, a particularly promising field for patient-specific treatment. The Neuroscience Department has distinguished itself particularly with its work on deafness, the brain or autism: in 2003, Thomas Bourgeron's team identified genetic mutations in autistic children for the first time. The Institute's interest in vaccines is, needless to say, ongoing, with improvements to existing vaccines, the search for new vaccines (malaria, AIDS) and particularly the work that has been developed over recent years into therapeutic vaccines against cancer.

The quality of the Pasteur Institute teams continues to receive recognition: in March 2011, three of its laboratories were selected by Prime Minister François Fillon as laboratories of excellence (LabEx) under the terms of the "Investments for the Future" program: integrative biology of emerging infectious diseases (Philippe Sansonetti and Pascale Cossart), genetic and environmental control of immune response variability, towards personalized medicine (Matthew Albert and Lluís Quintana), and stem cells and regenerative medicine (Philip Avner and Shahragim Tajbakhsh).

2012 brought two major awards for two Pasteurians, both also professors at the Collège de France: Christine Petit was awarded the Brain Prize for her work on deafness by the Grete Lundbeck European Brain Research Foundation (Denmark), and Philippe Sansonetti the Grand Prix INSERM for his research into microbial infection, revealing the genetic bases of bacterial virulence, particularly *Shigella*. In September 2013, Margaret Buckingham received France's most prestigious scientific distinction, the CNRS Gold Medal, for her work on developmental biology pursued throughout her career at the Pasteur Institute. The 2013 Balzan Prize, an international award that recognizes scientific excellence, was awarded to

three French scientists, including Pascale Cossart for her fundamental contribution in the field of the molecular biology of bacteria and their interactions with host cells. In 2016, Christine Petit was awarded the Hugh Knowles Prize and in 2018 the Kavli Prize in neuroscience for her pioneering work on the molecular and neural mechanisms of hearing.

PART II

PASTEUR AND HIS HEIRS

“You will see how all this will grow.”

Louis Pasteur.

FROM ONE DIRECTOR TO THE NEXT

“To constitute a Pasteur Institute, it is not enough to build research and teaching laboratories, equipped with the most sophisticated of tools, it must still be imbued with the Pasteurian spirit, namely the scientific faith that promotes zeal in one’s work, the imagination that inspires ideas, the perseverance that pursues them, the experimental rigor that proves them, and also the independence and the disinterestedness that are a consequence of passionate love of the truth.”

Emile Roux, 1898.

The Constituent Parts of the Institute

Over and above the research work on which the Institute’s reputation was initially established, other elements also played an essential role. From its very creation, the Institute was an original institution by virtue of several features of overarching importance to Louis Pasteur: private status, the application of research, teaching and the Institute’s international ambition.



The historic building of the Pasteur Institute, around 1889.

Having experienced for himself the heavy burden of official bureaucracy, as a professor in Lille and Strasbourg, and at the Ecole Normale, Pasteur was determined that the future institute would be absolutely independent and separate from the university system. Indeed, the hostility directed against him by many physicians precluded any links to the faculty of medicine. Hence the private status of the Institute, in the form of a foundation with recognized charitable status, granted by the decree of June 4th, 1887. Among other freedoms, this status allowed the Institute to recruit its staff at will from a range of disciplines, and particularly among foreigners without diplomas from a French university, and to organize the Institute's resources according to an original model: income drawn from its capital and from its business, the sale of serums and vaccines, which in turn financed its research, was coupled with the generosity of the public. Pasteur's principal concern was research directed essentially towards medical applications, as expressed in the famous phrase:

No, a thousand times no; there does not exist a category of science to which one can give the name applied science. There is science and there are the applications of science, bound together as the fruit to the tree which bears it.

This is the foundation on which the Institute rests, with its public health orientation being at the same time a source of income. Pasteur had announced as much himself in his speech at the inauguration:

Our Institute will be at once a dispensary for the treatment of rabies, a center for research into infectious diseases and a center for education in microbial research.

He entrusted the educational task to Emile Roux, who would devote much of his time to it. The course focused primarily on the Pasteurian disciplines and proved particularly attractive to physicians, hospital pharmacists and veterinarians, many of whom later found themselves working in the Institute's laboratories.

When it came to the international dimension, Pasteur once again proved a visionary: not confining his interest to domestic diseases, he was keen to understand and contend with tropical diseases and to "train young scientists who will carry the method to distant countries." In 1883 he dispatched a mission to Egypt to study cholera and in 1891 asked Calmette, then aged 27, to travel to Indochina to set up the first Pasteur Institute overseas ("Calmette, you're something of a sailor, how would you like to go out there and take over its management?").

These four elements are still central to the Pasteur Institute to this day, and successive directorships have maintained the Institute's originality within this unaltered framework.

On the death of Pasteur, Duclaux was appointed director of the Institute on October 16th, 1895. A graduate of the Ecole Normale and a chemist like his mentor, he was closely associated with all of Pasteur's work, demonstrating the same great diversity of interests. Grancher was a great admirer of Duclaux, and considered his work *Ferments et Maladies* (*Ferments and Diseases*) as the very gospel of the new doctrine.

Duclaux's first decision was to ask Madame Pasteur to remain at the Institute, which she did until her death in 1910. There was no more discussion of Duclaux's appointment than there was in 1904 for the appointment of Roux, unanimously nominated to replace Duclaux following his death on May 3rd. Roux, who was keen to retain Chamberland and Mechnikov as deputy directors, embarked on a long "reign" that continued unchallenged until 1933.

Within some fifty years of its founding, the Pasteur Institute had made its mark, hallowed by the personality of its founder and the major discoveries made by his successors (serum therapy, discovery of the causative agents of plague, typhus, malaria, the BCG vaccine, the microbial activity of sulfonamides), playing a semi-public role in the field of health, particularly during the First World War, teaching the new disciplines and extending French influence to all climes. The death of Dr. Roux marked the turning point of these dazzling beginnings. A sense began to emerge of a deep-seated need for reorganization:

The Pasteur Institute was made up of Mr. Roux, surrounded by the whole world's admiration: the scientific and moral direction of the Institute, its administrative and financial management, its relations with the outside world, rested solely with him," wrote Alfred Lacroix, chairman of the Board of Directors, adding: "the dictatorial regime that had characterized his management was possible only in his hands.

In March 1934, a committee tasked with the reorganization of the Institute presented an initial report designed to create order in the administration (departments had no annual budget, there was no inventory, the manufacturing and sales departments were widely scattered, there was no administrative and financial controller, etc.).

A second report called for the creation of a scientific council. In 1937, however, certain members of the Board of Directors took exception to the fact that none of the measures had been applied, and produced a very harsh analysis of the situation in which the Institute found itself:

“These are grave times for the Institute Pasteur and, no doubt, the Board as a whole fails to realize this, for lack of the necessary information,” they wrote to the Board, in the full awareness of their moral, administrative and legal responsibility. “The Pasteur Institute is in decline because the sacred fire that inspired the Pasteurians in its golden era is now extinguished.”

A number of points seemed particularly serious and, in their eyes, the reason for the Institute’s decline:

- The anarchy that reigned in the organization of the laboratories, a scattering of laboratories created at random as the years went by, some without a head in charge, heads of department with no departments.
- The recruitment of scientific personnel based not on any ethical rules but on personal contacts rather than scientific merit, had burdened the Institute with unwanted and unnecessary staff.
- Lastly, researchers no longer devoted all their time to the Pasteur Institute but they pursued paid activities elsewhere.

The report’s authors concluded that the Pasteurian spirit that had been the driving force of the Institute’s early years was in peril: “Ask the French and foreign scientists who know the Pasteur Institute well: to a man, they will tell you that in a few years Pasteur’s institute will be no more than a museum.”

A diagnosis reached in 1934, followed by a vigorous appeal in 1937, made several recommendations, including the creation of a scientific council, a clear status for staff, an administrative and financial controller, a reorganization of the laboratories, etc. These measures however were not applied before 1940, perhaps not the best of times, and even then, only partially. The necessary, thorough reorganization would only come much later.

It was a physician, Dr. Louis Martin, who was elected to succeed Dr. Roux. As an intern at the Hospital for Sick Children, he had been involved in the hospital’s research on serum therapy for diphtheria, and went on to become the director of the Hôpital Pasteur created in 1900. He nevertheless paled somewhat into insignificance alongside the Scientific

Council founded at this period, consisting of Jules Bordet, Alexandre Yersin, Charles Nicolle, Amédée Borrel, Félix Mesnil and Gabriel Bertrand. He was in no haste to apply the reforms demanded by the Board of Directors: “The Pasteurian spirit is waning... the scientific staff is burdened with mediocrities,” wrote Emmanuel Leclainche in 1937. Nevertheless, it was in these final years leading up to the Second World War that Ramon, whose discovery of anatoxins had won him great international fame, energetically ran the so-called “Garches” annex (actually located in Marnes-la-Coquette); that brilliant work was done in therapeutic chemistry; that the microbial physiology department was opened under the direction of André Lwoff and Moïse Schoen; that management created a Pasteur Institute in Shanghai; and that an annex of the Pasteur Institute of Brazzaville was opened in Bangui.

In May 1940, age officially brought Louis Martin’s term of office to an end, and Gaston Ramon was appointed director effective as of from July 1st. André Boivin and Noël Bernard became deputy directors and Dr. Dujarric de La Rivière took on the newly created post of Secretary General. Shortly thereafter a Chairman of the Board was elected, namely Pasteur Vallery-Radot, Pasteur’s grandson (nicknamed PVR¹⁹), physician and head of department at the Hôpital Bicêtre. Following several months of tension, Ramon resigned in December 1940. He was replaced by Jacques Tréfouël, who would go on to head the Pasteur Institute until 1964, i.e. for a total of 24 years!

A student under Fourneau, for whom he had the greatest admiration, Tréfouël was a key figure in the rise of therapeutic chemistry. A brilliant researcher, he agreed to take on the additional responsibilities of management, a particularly delicate task during the difficult war years. Apart from the circumstances that rendered normal life hard enough, the presence of the occupying forces naturally weighed heavily on the Institute: in October 1941, the chief executive of Behringwerke AG and director of IG Farben demanded the delivery of a large quantity of serums and anti-toxins, to which the Institute agreed. These executives then voiced a desire for Germany and France to cooperate on biological manufacturing, which they decided to submit to the French government. After a visit to the Institute by three representatives from Behringwerke, in December 1942 the Minister for Public Health urged the Pasteur Institute to comply with this.

At the same time, production of the typhus vaccine was neatly transferred to the free zone, to the Laroche Beaulieu estate, and Jacques Tréfouël played an important role in the Resistance, particularly in camouflaging medical equipment and supplies. In his book *Du côté de chez M. Pasteur* (“Mr. Pasteur’s Way,” in imitation of Proust), Pierre Gascau relates how one Pasteurian surreptitiously removed a typhus bacillus culture from the Institute and managed to use it to contaminate a quantity of butter destined for a Wehrmacht unit stationed in the Paris region!

Like the rest of the country, not all Pasteurians made the same choices: this led Pasteur Vallery-Radot, who had made contact with the Free French as early as 1940, to consider the possibility of purging members of the Institute and the Assembly, some of whom had more or less openly opted for collaboration with the Germans. The arrest of Eugène and Elisabeth Wollman was, without a doubt, the most dramatic event of this period. Three laboratory assistants, also Jewish, suffered the same fate.

Soon after the war, financial difficulties began to loom large, inflation weighed heavily on the Institute and its cash flow was a matter for concern. With continuing ups and downs, the situation would grow steadily worse until the government was forced to intervene in the 1970s.

There were a number of key phases during the Tréfouël years. First came the reorganization of the laboratories and departments, and in particular the creation in 1953 of three departments carved out of the original biological chemistry department (Jacques Monod, Marguerite Faure, Daniel Bertrand) and, in 1960, the creation of a microbial genetics department headed by François Jacob. The Institute next went on to add to its property portfolio, particularly by acquiring adjoining plots of land that would later allow for more construction. The Viruses Pavilion was built thanks to a substantial donation from Madame Darré, and inaugurated in June 1954.

Overseas, several institutes experienced troubled times as a result of local nationalist movements: the Pasteur Institute in Shanghai came under the control of the People’s Republic of China in May 1950; after difficult negotiations, the Pasteur Institute in Hanoi was closed and handed over to the North Vietnamese authorities; the Pasteur Institute in Algiers would also feel the effects of “events.” Elsewhere, however, Guadeloupe saw the creation of a Pasteur Institute, as did Yaoundé, and a subsidiary of the Brazzaville Institute opened in Bangui.

Finally, discussions began to revolve around two problems vital to the Institute's future: its financial situation, which was becoming a constant cause for concern, and the need to separate the "practical" departments from the "research" departments. Discussion of these concerns paved the way for the subsequent creation of a new entity for production.

Teetering on the Brink after such Dazzling Beginnings

The scale of its financial difficulties gradually brought the Institute closer and closer to the brink. Paradoxically, it had never made a penny from the discovery of the sulfonamides, which it allowed private industry to exploit, and also missed out on antibiotics. Assets invested in French annuities melted away like snow in the sun, vaccines unprotected by patents suffered from the competition of increasingly powerful and well-equipped pharmaceutical firms, whereas the Institute's production facilities were amateur by comparison.

The management of the Institute operated in a vacuum, with researchers wholly unaware of how the Institute was administered, heads of department appointed virtually for life, and so on.

Clearly, what was desperately needed was reform of the statutes and complete reorganization, which took on the air of a "revolution," largely under the stewardship of Elie Wollman, Jacques Monod and François Jacob.

The statutes and the organization dated back to the time of Pasteur, to which they were well suited, but the world had moved on since then and now it was necessary for the scientists to become more closely involved in the management of the Institute and to separate the business of production from research in order for each to develop according to its own logic. Ranged in opposition against Pasteur's grandson, Pasteur Vallery-Radot, Chairman of the Board of Directors, and indeed the entire Board, which staunchly opposed any reform, the scientists leveled against him the charge that he, "through his incapacity and his negligence, is leading this scientific institution to ruin" (December 17th, 1965). They forced through the mass resignation of the entire Board of Directors and insisted on the appointment of a transitional director for two years period during which new statutes could be drawn up. Despite the candidacy of Nobel laureate André Lwoff, backed by most of the researchers, the new Board appointed as director the Secretary General Pierre Mercier, a retiring and harmless

character, and once again missed an opportunity to reform and modernize the Institute.

The financial crisis was by no means settled, and a very real threat hung over the very existence of the Institute. This time a savior was needed, and he arrived in the form of Jacques Monod, appointed in April 1971. His standing as a Nobel laureate and his strong personality enabled him to win far more substantial government support. On the basis of a report drawn up by Roland Morin, a Chief Councilor at the Cour des Comptes (French court of auditors), the Minister of Health Simone Veil confirmed the authorities' commitment to providing almost 50% of the Institute's funding. The Institute, for its part, had made a substantial effort by adopting a "rescue plan" that involved closing down fourteen departments and cutting 24 posts in research and 140 technical and administrative assistant posts, mainly through early retirements. In March 1975, the government decided to insert into its 1976 budget sufficient credits to ensure the foundation's financial equilibrium. The sum of 43.5 million francs, in place of the 32 million francs provided in 1975, clearly acknowledged the public service provided by the Institute's activities.

This decision enabled the Institute to weather a difficult period and, quite simply, to survive. Jacques Monod thus played a major role in rescuing the Institute, greatly aided in this by another remarkable Chief Councilor at the Cour des Comptes, Jacques Bonnet, whom he coopted to bring the administration and the finances of the Institute back on track.

In addition to masterminding the financial rescue of the Institute, Monod's other great contribution was the reorganization of the manufacture of vaccines and the creation, in October 1971, of a limited public company, Institut Pasteur Production, with the construction of a plant in Louviers. Other initiatives included the construction of the molecular biology building, inaugurated in May 1973 by Jean Charbonnel, Minister for Industrial and Scientific Development; the first meeting of the directors of the overseas Pasteur Institutes; and the inauguration of the Pasteur Institute in Abidjan.

After a long illness, Jacques Monod died in May 1976. He was succeeded by François Gros, a very great scientist who did pioneering work on ribonucleic acids, and a close colleague and friend of both Jacques Monod and François Jacob and, indeed, of all the leading international

molecular biology teams. He was later appointed scientific adviser to Prime Minister Pierre Mauroy, and then to Laurent Fabius.

A professor at the Collège de France, Permanent Secretary of the Académie des Sciences, he played an influential role regarding policies relating to science. Under his leadership the immunology building was built and inaugurated in 1981, with the help of funding from British donor Lord Rayne. He launched a fund-raising campaign, very novel for its time, with the assistance of Joël de Rosnay, and was instrumental in the founding of the Association pour le Développement de l'Institut Pasteur (ADIP).

Raymond Dedonder succeeded him in 1982. He agreed to serve as director of the Institute only if François Jacob took on the role of President. This was a wise decision on his part, as he realized full well that he lacked easy access to political circles and the higher levels of the administration.



Left to right: Jean Castex, Elie Wollman, Marie-Hélène Marchand and Raymond Dedonder, members of the Executive Committee of the Pasteur Institute in 1985.

Under his leadership, Jean Castex, the deputy director for administrative and financial matters, pressed on with the vital task of restoring the foundation's financial fortunes. From 1983 onwards, and above all in 1986-1987 (the years of the Duchess of Windsor's bequest, and of the

centenary of the Institute), income from bequests rose significantly: between 1987 and 2000, the Institute received half of all the bequests ever recorded in its history. In addition, a series of negotiations, brilliantly conducted by Jean Castex with the industrial partners, brought in a substantial and regular revenue stream, mainly from royalties for the use of the brand – the name of Pasteur himself.

After years during which the emphasis had been on fundamental research, in the wake of the 1965 Lwoff, Monod, Jacob Nobel Prize, Maxime Schwartz was appointed director in 1988 (and re-elected in 1995) and began refocusing the Institute's activity on revitalizing biomedical and infection research, as they represented the Institute's initial calling, its primary mission, and thus its image. He also saw sound financial reasons for this, as biomedical research lends itself to more rapid application than basic research does and could therefore prove of great help to the Institute's finances.



Michel Rocard, Prime Minister, and Marie-Hélène Marchand, general secretary of the Pasteur Institute, on the inauguration of the AIDS and retrovirus building on March 5, 1991.

The Pasteur Institute also began to build again: in 1990, a building destined for retrovirus and AIDS research, then a medical biology building. Thanks to the Duchess of Windsor's bequest, the Scientific Information Center, housing a new library and a magnificent 500-seater auditorium, was built, and inaugurated on 28 September 1994 by Prime Minister Edouard Balladur.

In 1995 and 1996, two additional buildings went up: the Human Resources building, followed by a dormitory for foreign trainees. Lastly, in 1999, a building to house staff amenities (cafeteria, Works Council, infirmary) opened its doors. These were years when the look of the campus changed radically. Great effort was made to modernize communications with the international network of Institutes and to restore the links that had been severed, on political grounds, with the Cantacuzène Institute in Romania and the Pasteur Institute in St. Petersburg, as well as to rebuild the Pasteur Institute in Cambodia.

The director was constantly harried by one major problem after another during this far from tranquil period, what with the affair of the *Annales*,²⁰ fall-out from the scandal involving contaminated blood and contaminated human growth hormone, his inability to prevent the hospital closure, not to mention the endless negotiations with an industry constantly prey to constant mergers and the ongoing restructuring of the pharmaceutical vaccines industry, and the trial in the US. Maxime Schwartz and Jean Castex got along perfectly to the benefit of everyone involved. While Castex sought to remain in the background, Schwartz later stated that he had never even thought of making any important decision without having first asked Castex for his opinion.

The agreement reached in 1987 between the Pasteur Institute and the US Department of Health had ended the war over patents filed respectively by Luc Montagnier and Robert Gallo (National Institutes of Health). Although not particularly favorable to the Pasteur Institute, it had nevertheless been accepted and the parties had ruled out any attempt to overturn the decision. In March 1990, however, a crucial investigative article by John Crewdson, an American journalist with the *Chicago Tribune*, and fresh scientific information published by Robert Gallo in *Nature* and by the Pasteur Institute in *Science* led clear conclusion that the discovery that had enabled the development of kits to test for AIDS had indeed been made in the Pasteur laboratory. Showing all the tenacity of Raymond Dedonder, Maxime Schwartz would insist on and succeed in

obtaining a review of the agreement. As he wrote, “truth reclaims its rights.” He won this moral victory on behalf of the Pasteur Institute which would now receive a more equitable share of the royalties.



Scientist examining the development of bacteria *Bordetella pertussis*, agent of whooping cough.

After Maxime Schwartz’s twelve years at the helm, Philippe Kourilsky was appointed director of the Pasteur Institute in October 1999. He took up office on January 1st, 2000. Like Athena, springing fully armed from the brow of Zeus, plans for a reorganization of management and a program of action for the coming years had all been worked out long before he took up the reins of office. The outside world was changing and, convinced of the urgent need to adapt the Institute to an increasingly competitive international environment, the new director had relied on informal discussions held over several months with different circles inside the Institute. These discussions all pointed to the need for change in order to enter the new century on the best possible terms.

He was therefore perfectly comfortable with reforms aimed above all at excellence and openness: excellence in research first and foremost, based on rigorous evaluation, high quality recruitment, particularly of young researchers; openness by means of renewed partnerships, not only with traditional partners such as CNRS, INSERM, hospitals or industry, but also with international partners such as the European Union and the World Health Organization, and further expansion of the Pasteur Institute

International Network. He believed his initiatives could be achieved in full accord with Pasteurian traditions.

Breaking down internal barriers by fostering horizontal and transversal cooperation through cross-disciplinary research programs involving research units from different departments, forming young five-year groups, and applying the twelve-year rule for the evaluation of department heads would revitalize and give new impetus to the scientific work. The program was welcomed by young researchers, stifled by the excessive weight given to seniority, who saw it would provide the opportunity to embark on their scientific careers in the best possible environment.

For Philippe Kourilsky, the Pasteur Institute International Network and associate institutes also represented a magnificent conduit for French aid to developing countries, a core element of the Pasteurian vocation. He felt such aid was massively underfinanced given the geopolitical and public health issues at stake, particularly by comparison with American levels of funding. Confining the International Network to the French-speaking world seemed to him something that needed to change, and he felt the network should be extended on a much wider scale to include new partners, including those in the English-speaking world, in the wake of what had begun in Hong Kong.

The early years were extremely active in very different spheres: the establishment of an external scientific steering committee chaired by Harold Varmus; the creation of the Biotop startup incubator and of the Genopole (five technological platforms geared to genomic and post-genomic research); the Amsud agreement signed with the Uruguayan Ministry of Foreign Affairs to develop cooperation between the Pasteur Institute and the Mercosur countries, a region with a tradition of Pasteurian influence; the launch of 17 transversal research programs (PTR) and one major horizontal program; inauguration of the Korea Pasteur Institute and another in Shanghai; reorganization of the Pasteur Institute International Network, its incorporation into the new Department of International Affairs, headed by the brilliant career diplomat Michèle Boccoz; reorganization of the research departments, etc. These bold beginnings were gradually to meet with resistance from a certain number of researchers, no doubt shaken out of their comfortable habits and feeling insufficiently involved in the process. This feeling was to lead to the clash that will be described in the following chapter.

THE VIRUS OF DISCORD AT THE PASTEUR INSTITUTE

“You should live in the serene peace of laboratories and libraries.”

Louis Pasteur

Five days before his death in February 2005, Hubert Curien, former Minister for Research, and highly respected scientist, attended a breakfast with a handful of members of the Assembly of the Pasteur Institute. An Assembly member himself, he was keen to hear the arguments put forward by Philippe Kourilsky on the subject of the crisis gripping the Pasteur Institute over recent months: the Board of Directors had just resigned en masse at the instigation of its Chairman Michel Bon, there was growing agitation on campus, and the opposition to Philippe Kourilsky was taking on a violent and increasingly unacceptable form. And yet “the Pasteur Institute did not deserve this, Philippe Kourilsky did not deserve this,” Hubert Curien said to me that morning.

How is the crisis that shook the Pasteur Institute to its core in 2004-2005 to be understood? How had the splendid dream of Philippe Kourilsky, appointed in 2000 to bring the Pasteur Institute into the new century, been transformed into a nightmare for the man himself and into a major crisis for the Institute? Passion, anxiety, and irrationality itself had created an explosive mixture. Management was no longer able to communicate with its troops, such was the prevailing atmosphere of mistrust and incomprehension.

Any attempt to understand it must undoubtedly begin with an analysis of the various actors concerned: Philippe Kourilsky, the brilliant Collège de France professor, and a number of highly influential researchers, the circumstances (Fresnes, or the poisoned chalice); even the overall context of research in France. Over-heated imagination took care of the rest, along with the remarkable capacity of some to deploy high-minded words (preserving the Pasteurian spirit) that concealed out-and-out self-interest and very different conceptions indeed of Pasteurian research.

Headlines in the press over the year 2004-2005, make it clear that, in a matter of months, the Pasteur Institute had become a powder keg ready to explode. “Discord rages at the Pasteur Institute” (punning on *rage*, the French term for rabies), “The virus of discord,” “Pasteur management has researchers seething,” “Pasteurians on the brink,” “Crisis reigns at the Pasteur Institute,” “Mass resignation at the Pasteur Institute,” “Pasteur Institute at a standstill,” etc. The foreign press also carried the story, putting the Pasteur Foundation in a very uncomfortable position as it prepared to welcome President Clinton to its April 2005 gala in New York.

The general enthusiasm that had surrounded the appointment of Philippe Kourilsky had vanished. After 12 years under the leadership of Maxime Schwartz, the last of which proved very difficult for him, Philippe Kourilsky had been warmly welcomed on his arrival. Nominated by Philippe Rouvillois, who saw him as the only person capable of breathing new life into the Pasteur Institute, Kourilsky had rallied his troops with his vision of a promising future at the start of the century, and vowed to do everything possible to develop the Institute.

Later at a gathering of a few close friends to mark his departure, Kourilsky quoted with self-deprecating humor the words of Edgar Faure after his reform of the national education system: “Having decreed change, I launched inertia, and now I don’t know how to stop it!”

How did matters reach such a state of violent incomprehension? Who were the key figures involved? Why did the much-needed renovation of the campus lead to such a conflagration?

The Key Figures

It was, of course, Philippe Kourilsky, President of the Pasteur Institute who was at the center of the affair. A great and fine mind, he had had a brilliant career up to this point. A renowned immunologist, pioneer of genetic engineering, he was one of the young guard of graduates of the Ecole Polytechnique that Jacques Monod had brought into the Pasteur Institute in the early 1970s to revitalize research. He spent his whole career there, but his enquiring mind and, no doubt, his ambition, led him to explore other avenues: scientific policy at the highest level (he acted as advisor to the Directorate General for Scientific and Technical Research (DGRST), then headed by such eminent figures as Pierre Aigrain, Hubert

Curien and Bernard Grégory); the world of business by founding Transgène, France's first biotech company, with Pierre Chambon; the vaccines industry, by becoming Scientific Director of Pasteur Mérieux. He was brilliant, he was successful, he was away from campus a great deal – and Pasteurians are emotionally attached to the confines of their exclusive cozy universe. Many considered him not to be a true Pasteurian. Indeed, he was not even invited by Agnès Ullmann to contribute to the collective tribute to Jacques Monod which retraced the origins and the adventures of Pasteurian molecular biology – probably an early sign that he was not considered one of the “family.” But an immunologist he most certainly was. As head of the Immunology Department, for many years he had run it as a state within a (Pasteurian) state, giving management short shrift.

Opposing him were the researchers, obviously not a homogenous group. They divided into several strata. Among the most best-known, some unfortunately found themselves in the building slated for renovation. The idea of moving to Fresnes was anathema to them, especially as they felt that news of their probable transfer had not been delivered in the most diplomatic manner. Some of them were famous figures in the world of international science, garlanded with prizes and research contracts; they felt they contributed much to the Pasteur Institute by way of their reputations and therefore did not want management interfering in their day to day lives unless, of course, it was to provide assistance, when needed, with the running of their laboratory... or to put them center stage.

Articles in the press and statements from certain Pasteurians at the time would have had everyone believe that all the researchers, without exception, were opposed to Philippe Kourilsky. This was not the case: he had some loyal and active supporters who continued to voice their approval of the reforms and remained his true friends, but they were no doubt too few in number, no doubt not well enough organized. Some, however, were actually quite prepared to move to Fresnes. On the whole, the young researchers to whom Philippe Kourilsky had entrusted greater responsibilities largely supported management, as did administrative executives.

The Circumstances

It was the renovation of the campus that sparked the crisis. For months, the National Labor Relations Board had been nagging the Pasteur Institute to comply with health and safety rules. In addition, space for research

laboratories was running short and the need for a new research building was clearly apparent to a Philippe Kourilsky keen to create new momentum: an institute that builds is a dynamic one. The combination of these two elements was to prove devastating.

Bringing the premises into line with regulatory standards was indeed a matter of urgency, particularly in terms of ventilation and fluids circulation.

Final notices from the Labor Board were accompanied by a demand for the complete audit of the air exchange systems. Conducted by Bureau Veritas over the summer of 2002, the audit identified a series of major non-conformities in several buildings: Duclaux, Lwoff, Borrel, Calmette, Guérin and BioTop. This meant a massive renovation program, involving water chillers, ventilation, the installation of blower and extractor systems, which in turn would inevitably mean vacating some areas and almost certainly relocating certain activities or units off campus. A renovation plan, covering both the technical and financial aspects, was presented to the Workplace Health & Safety Committee in December 2003.

More space was also urgently needed. Since its founding, the Pasteur Institute had expanded gradually; a number of buildings had been added in recent years, at the initiative of Maxime Schwartz and Jean Castex, thanks to sound finances, but even so researchers were crammed together, with an average of just 9 square meters of floor space apiece. To provide optimal working conditions and incorporate the latest technology on a par with the leading international laboratories, the Institute needed to build, or else it would have to give up creating the young research groups so essential in keeping science dynamic. An application for a building permit was therefore filed in July 2003, with the approval of the Board of Directors. The option chosen was a two-phase construction plan: 15,000 square meters for the central lot, then 8,000 square meters on a side street. The premises were due to be delivered to the summer of 2007.

These two projects could not proceed without relocating a certain number of laboratories. At this precise moment, the American pharmaceutical firm Pfizer donated a complex in Fresnes (south of Paris) to the Institute consisting of two buildings plus a third that was available to rent. In the context described above, the gift of these two buildings, tailor-made for research activities, seemed like a godsend. It was soon to become more of a curse than a blessing!

In spring 2004, the decision was taken to accept the Pfizer donation, and Philippe Kourilsky drew up an initial list, coherent and carefully thought out, of the researchers he planned to relocate to Fresnes, thereby vacating premises for the renovation. This list was instantly and vigorously contested, for the most part by some of the researchers concerned by the move; under pressure from various internal lobby groups and after several versions of the famous list, management proposed that the move should be on a voluntary basis. That brought an end to the scientific coherence of the project, and the whole matter became impossible to manage calmly. The signature of the Pfizer donation was hurried through on July 1st, in the hope that a *fait accompli* would put an end to the agitation. Unfortunately, it did nothing of the sort, and a stressful summer and autumn was to follow.

Relations between Philippe Kourilsky and CODIS (the committee of department heads) were gradually undermined by a scattering of ever darker clouds, followed progressively by the relations between Philippe Kourilsky and “the campus,” i.e. a faceless mass composed alternately, or even simultaneously, of a handful of Institute “stars,” others who were close to the “Sauvons la recherche” (save our research) movement, and a small group resolute in its opposition to management.

At the end of a heated session, the first round of the Assembly of June 2004 refused the activity report for 2003 as presented by the Chairman of the Board of Directors; this was the first time such a report had not been approved by a relative majority. Mr. Bon concluded that the Board was not technically required to resign.

This was the day on which trust was shattered between the Pasteurian members of the Assembly and the Board of Directors, and hence with its bureau, with the management of the Institute and, on a more personal level still, with its President. Far overstepping their rights, the Pasteurians on the Assembly looked upon themselves as the representatives of the campus; they set up their own bureau, something for which no provision existed in the statutes, which then, acting with complete illegality, proclaimed itself the sole designated point of contact with the Board of Directors and demanded the resignation of the Chairman and then of its bureau. The Chairman, having met with the most intransigent members of the Assembly, decided to present the President with a new roadmap in September.

Constant demonstrations on the steps of the Pasteur Institute before, during and after Board meetings and stormy CODIS meetings punctuated the final quarter of 2004. The end of the year was so tempestuous that Philippe Kourilsky decided to call in a mediator, the famous British virologist John Skehel, chosen by the heads of department to examine the dossier relating to conflicts over relocation.

On December 16th, again without any legality, the “opponents” circulated to all Pasteur Institute staff, using the internal communication channel to do so, an e-mail entitled “Pasteur Institute in danger,” calling formally for the resignation of the Chairman of the Board of Directors and the replacement of the bureau, and the immediate departure of the Deputy President for Operations. He and the director of Human Resources bore the brunt of the scientists’ hatred, on the alleged grounds of their “brutal managerial methods” – blaming them, in short, for subjecting a population that had luxuriated for decades within the undemanding rules of public service to the kind of measures only too common in the world of private enterprise.

It was a red line that the basic “Pasteurian” refused to cross, even though the Pasteur Institute actually has private status. Anecdotal perhaps, but symbolic, was the lab technician taking part in an anti-management demonstration, energetically brandishing a placard proclaiming “NO TO PRIVATISATION” and his stupefaction when I walked up to him and informed him: “The Pasteur Institute has been private since it was first founded in 1887, you know!”

John Skehel submitted his report in early 2005, concluding that the necessary renovation of the premises could be carried out without the need for the planned move to Fresnes. The report was, in some way, a foregone conclusion.

The process of relocation came to a halt. That did not mean everything was now settled, far from it: real estate was not the only issue inflaming tempers. Certain decisions had triggered violent reactions: the renegotiation of the company-wide agreement for management and staff, merit-based promotions, the forced retirement of two scientists who had not been received by the President with the honors due to their rank and, more generally, a sense that consultation was merely a token gesture and all the decisions had already been made before listening to the views of

those concerned, etc. Ultimately, Philippe Kourilsky had failed to convince his audience that his projects were well- founded.

The atmosphere within the Institute was extremely tense; not one of the measures taken by management to soothe outraged hearts and minds found favor in the eyes of the researchers: internal memos were denounced as attempts at manipulation, closures of units on the grounds of age or insufficient scientific quality were seen as the means of settling old scores, executives brought in by Philippe Kourilsky from the pharmaceutical industry were accused of selling the Pasteur Institute out to private sector interests.

In fact, there was by now no love lost between the President and the heads of department; and, given the circumstances, the Chairman of the Board of Directors, who had expressed complete confidence in Philippe Kourilsky, no doubt unaware of the storm brewing, would be facing ever growing criticism.

At the same time, the President Philippe Kourilsky bravely stepped into a public debate. Joining François Jacob, Jean-Marie Lehn (both Nobel laureates) and Pierre-Louis Lions (Fields medal winner) he co-signed a long manifesto: “NERF: a new élan for French research”²¹ which caused an uproar in the spring of 2004. The manifesto argued in favor of excellence, advancement on merit, rigorous evaluation of scientific projects by impartial experts, and other red flags to the members of the “Sauvons la recherche” lobby, who were firmly entrenched in their commitment to advancement based on seniority and the demand for “jobs, jobs and more jobs.” At this time, Philippe Kourilsky was travelling a great deal, setting up Pasteur Institutes overseas, in Shanghai, South Korea and Montevideo, which no doubt extended the range of France’s influence considerably, but also provided ammunition for the opponents reproaching him for jetting off while the Institute burned.

Finally, at an epic and, in many ways surrealistic meeting, during which the intemperate nature of the criticisms leveled at Michel Bon and Philippe Kourilsky did no credit to their authors, Michel Bon suggested that the entire Board should resign. Increasingly isolated, Philippe Kourilsky suggested to Philippe Rouvillois that he should gather together the former Chairmen of the Pasteur Institute (François Jacob, Marcel Boiteux and Bernard Esambert) and, since all four were highly esteemed and respected, that they should guide the Institute to the best of their abilities in this new

phase by choosing the members of a new Board. In a message sent on March 15th to the Assembly, whose task it was to elect the Board, the former Presidents reiterated that the spirit of reform should continue to prevail, that the Institute should pursue its international expansion, and that the consolidation and expansion of the International Network, already well under way in Asia, would contribute to this. This proposal implicitly paid tribute to Philippe Kourilsky, by indicating that the task of the new Board would be to prepare to choose “a President able to develop and perfect the action already undertaken by Philippe Kourilsky.” Things had gone too far for the opposition, however, and the Chairmen felt they could no longer support Kourilsky; he was painfully conscious of the fact and tendered his resignation in July 2005. It was a tremendous disappointment for a man with a splendid vision of the Pasteur Institute and of his role within it.

Several members of management, however, had sent a document to the new Board of Directors emphasizing the important changes initiated by Philippe Kourilsky to modernize and develop the Institute and demanding that these be pursued, including the recruitment of young scientists or leaders in fields considered strategic, evaluation mechanisms, opening up to the business world and international initiatives, giving strong support to the principles that had prevailed since 2000.

Peace is Restored

François Ailleret, former CEO of France’s National Electricity Company, took over as Chairman of the Board to restore peace within the wounded Institute, and Alice Dautry, a researcher at the Pasteur Institute since 1977, was appointed President on October 1st, bringing a tumultuous academic year to an end. From 2005, peace was effectively restored to the Pasteur Institute. Researchers felt, rightly or wrongly, that science had regained its eminence at the expense of so-called “technocratic” reforms. In 2006, though, certain researchers, determined to make their resentment public, did not hesitate to once again lay all the evils at the feet of Philippe Kourilsky. In an article in an English-language scientific journal, they accused him of seeking to transform the Pasteur Institute into a business and, worse still, to give it an American veneer.

Fortunately, others wrote to *Nature* to protest and to pay tribute to Philippe Kourilsky’s dedication to the Pasteur Institute and to the quality of the measures taken by him that had breathed new life into the institution.

Happily, passions calmed and Philippe Kourilsky was once again granted an office at the Pasteur Institute!

During Alice Dautry's term of office as President, which ended on September 30th, 2013 (she was effectively re-elected in 2008 since she proved to be the only candidate), a number of projects initiated by Philippe Kourilsky came to fruition. Plans for a new building dedicated to emerging diseases were carried through and the building inaugurated on November 14th, 2012 by French President François Hollande. In 2006, a key agreement was signed with the US Department of Health (HHS) to coordinate the fight against avian influenza (the bird flu). And the Pasteur Institute of Montevideo was inaugurated thanks to a novel funding mechanism (a debt conversion agreement between France and Uruguay).

2008 was a particularly momentous year for the Pasteur Institute. Françoise Barré-Sinoussi and Luc Montagnier were awarded the Nobel Prize for their work on isolating the AIDS virus. The Institute was declared a "great national cause," a label* that greatly facilitates fundraising. And the celebration of the Institute's 120th anniversary, of which more later, continued throughout the year.

In November 2012, another new building was inaugurated. Named after François Jacob, an outstanding figure at the Pasteur Institute, it was designed to promote multidisciplinary and dialogue between researchers, on the subject – of great importance to public health – of new infectious diseases that now spread so swiftly across the planet, as we have seen in recent years. Indeed, it was on this twofold target that Christian Bréchet, appointed President on October 1st, 2013, was keen to focus his term of office: recruiting brilliant young researchers to assure the Institute of its place in international competition, and reinforcing the role of the International Network in combating epidemics. The creation of joint international research units with the University of Kyoto, the Pasteur Institutes in Shanghai and Montevideo, for example, all bear the stamp of Christian Bréchet. Disqualified by his age from standing for a second term, he was replaced on January 1st, 2018 by Stewart Cole.

To gain a better understanding of the history of the Institute, we now need to find out more about those who wrote it, i.e. the Pasteurians themselves, in France and around the world.

*This official designation is meant to call attention to a specific nation-wide problem, urging individuals and organizations finding a solution to the issue.

WHAT IT MEANS TO BE A PASTEURIAN?

“With the first colleagues he chose for himself, Pasteur created a new type of researcher: ‘the Pasteurian.’”

François Jacob, address given at the opening ceremony of the Centenary of the Pasteur Institute, October 5th, 1987.

Who are the Pasteurians if not, first and foremost, the heirs of Pasteur? Like any human group, they are a diversified lot, and there is no single phenotype, but rather a broad range of personalities, some quite striking, others more subdued, and all fascinated by the example of Pasteur. On the eve of the inauguration of the François Jacob building, on November 13th, 2012, an excellent documentary entitled *Les Héritiers Pasteur (The Heirs of Pasteur)* was screened on television; it examined the question of how exactly the Pasteurian differed from any other scientist. Admiration for Pasteur, his scientific rigor and his genius for experimentation, are key elements of the Pasteurian microcosm.

Since the days of Professor Parapine and the “greying old schoolboys” of the Institut Bioduret, too strangely reminiscent of the Pasteur Institute at the turn of the previous century, as described by Céline in his novel *Journey to the End of the Night*, the Pasteurian has obviously changed a great deal. Today’s Pasteurians are more likely to be wearing jeans and sneakers than a suit and tie, may sport the odd tattoo or wear mismatched socks, but what they undoubtedly share with their predecessors is curiosity and a desire to understand the living world, the patience and obstinacy needed to discover (be it only a fragment of a result), and, above all, a passion for tasks deemed thankless by those who know nothing of research, but that promise its adherents the heady pleasures of limitless avenues for intellectual exploration.



Louis Pasteur surrounded by his colleagues in the main library in 1894.
 Front row, left to right: Albert Calmette, Louis Martin, Emile Roux, Louis Pasteur, Edmond Nocard, Henri Pottevin, Félix Mesnil.
 Back row, left to right: Jules Viala, Marcel Mérieux, Auguste Fernbach, Auguste Chaillou, Amédée Borrel, Louis Marmier, Louis Marie, Adrien Veillon.

The best of them possess the deep-seated desire that their work will provide practical solutions for public health problems and offer relief to humans who suffer. Like members of a religious order, the scientists working at the Pasteur Institute enjoy the privilege of the adjective “Pasteurian,”²² which instantly sets them apart. They are far removed from CNRS or INSERM researchers, for whom no similar qualification springs readily to mind. This could explain some of the irritation that Pasteurians have always inspired.

By assimilation, members of the administrative staff also describe themselves as Pasteurian, even if the researchers would be reluctant to allow them the privilege. Because at Pasteur, one must admit, in the terminology dear to former administrative and financial controller Jean Castex, there are two populations, the *alphas* and the *betas*: the *alphas*, of course, being the researchers, a noble race if ever there were, and worthy of the highest respect, and the *betas* are the rest! The mere fact of being a

Pasteurian, for those claiming the distinction, is nevertheless testimony to a certain sense of pride in belonging to a great institution, a pride that until recent years acted as a kind of internal glue particular to the institution.

In one case, an eminent Pasteurian who had retired twenty years earlier took violent exception when a parcel addressed to him at the Pasteur Institute was returned to sender marked “Not known at this address.” As he brusquely informed the mailroom employee, once a Pasteurian, always a Pasteurian, retirement notwithstanding, for the remainder of one’s natural life and, in certain cases, beyond!

Since 1888, a large number of little-known figures, some completely unknown to the general public, have played a considerable role in the history of the Pasteur Institute, leaving their imprint on its memory, and also on the collective memory of France. Among them we must include Pasteur’s first disciples, and start with the five heads of department appointed by Pasteur on the opening of the Institute before we come to the Pasteurians of today. Let us start with Pasteur’s immediate colleagues.

Emile Roux, “the lay brother”

Dr. Roux gave his name to the street in which the Pasteur Institute stands: Pasteur’s immediate deputy, an invaluable colleague in the work on rabies and a great scientist in his own right, it was Roux who created the first course on microbiology, soon to be known as the “grand cours” (The Class). It was he who designed and created the hospital, and he who ran the Pasteur Institute with an iron hand for 33 years, remaining its heart and soul until his death. Portraits of Roux, with his narrow, emaciated El Greco-style face and his piercing eyes, reveal an exceptional personality.

Born on December 17th, 1853 in Confolens, in the Charente department, where his father was a secondary school principal, Emile Roux lost his father at an early age and was taken in by his brother-in-law, an academic, whom he accompanied on his various postings. During an austere childhood, always on the threshold of poverty, Roux developed a passionate interest in the humanities, reading Virgil in the original Latin. But ultimately, he decided to pursue medicine not to treat the sick (“I hate sick people,” he was quoted as saying later), but in order to understand diseases. He went to Clermont-Ferrand where he met Duclaux, and then to Paris to take the entrance exam for the Val-de-Grâce military school.

Anne-Marie Staub, a Pasteurian who knew him towards the end of his life, gives a detailed description:

At that time, he already possessed a hard, piercing stare, his nose was narrow and straight; he was rather thin, pale, narrow-shouldered. He despised smart dressing and disdained all external show and ostentation, an attitude that remained with him throughout his life; in moral terms, he was an idealist, scrupulous, with great scientific ambitions, but these were equally used to attain his own personal glory. His rages would shake his slender body, contort his pale features and set his eyes blazing.



Portrait of Emile Roux in his laboratory in the 1900s. A close colleague of Pasteur's, he developed serum therapy for diphtheria and tetanus.

Duclaux had introduced the young physician to Pasteur, to assist him with inoculating animals. Roux became a laboratory assistant at the time Pasteur was embarking on his research into infectious diseases and rabies.

While discreet, the role played by Roux was crucial to the development of submeningeal inoculation and the study of the aging of the spinal cords of rabies-infected rabbits.

During this decisive period of Pasteur's work, Roux contributed his unmatched technical skills, his critical mind and his rigor, which sometimes clashed with Pasteur's enthusiasm. He put every effort into making the rabies vaccination a success and shared with Pasteur both the fears during preparation and the joys of success. At the death of little Louise Pelletier, he was an unfailing presence at Pasteur's side.

His participation in Pasteur's work did not prevent Roux from pursuing equally distinguished scientific research. Steeped in the chemist's approach instilled into him by Duclaux, Roux elaborated the idea that microbes secreted poisons and that these "toxins" could act at a distance from those parts of the body where the microbes were concentrated – a fundamental intuition. His successes in the discovery of the diphtheria toxin (with Yersin) and the cholera toxin (with Mechnikov) inserted him firmly into the lineage of the pioneers of microbiology, those who made it possible to immunize animals against the toxin, who discovered the antitoxin properties of serum (Behring and Kitasato) and the therapeutic serum antitoxin against diphtheria (Roux, Martin and Chailou, Budapest Congress, 1894). Roux also perfected preventive serum therapy against tetanus and an anti-cholera serum.

It was thanks to Roux that thousands of children were saved from diphtheria, which prompted *Le Figaro* to launch a national appeal for funds to purchase the horses needed to provide the blood used in serum therapy. Thousands of First World War wounded were saved from tetanus. The honors poured in, decorations, election to the Académie de Médecine and then to the Académie des Sciences, but he paid little attention, pursuing his scientific work despite failing health, creating the hospital in 1900 and taking over as the head of the Institute on the death of Duclaux in 1904.

A close colleague of Pasteur and a gifted researcher in his own right, Roux was also a remarkable teacher. Appointed head of department at the Institut Pasteur in 1888, it was Roux who organized the teaching of microbiology, commencing his first course on March 15, 1889. This class soon became famous, and was referred to as the "grand cours" or great course. The first auditors of the first one included Laveran, Mechnikov,

Hallion and Rappin, to name but four. The course left an indelible mark on all those who took it, and Roux proved to be a professor beyond compare. From 1904, the year in which he succeeded Duclaux as director, Roux devoted himself almost entirely to the administration of the Institute, spending less time on teaching and research; he ran it with an iron hand in an highly centralized, not to say autocratic, manner; in his view, it was an honor for researchers to work at the Pasteur Institute, and so he paid little attention to their material needs or to their salaries, despite being capable of great generosity. In 1892, he waived any salary increase proposed by Pasteur “until the Institute’s budget is better endowed” (according to the minutes of the Board Meeting of March 23rd, 1892).

1914 brought the First World War, and more upheaval for Roux: after having lost two of his brothers in the war of 1870, he lost his other, much-loved brother Henri in 1916. Roux organized laboratories for the army, produced anti-tetanus serum, thereby saving thousands of wounded soldiers from the scourge of tetanus, and had vaccines delivered free of charge to Allied forces. From 1916 onwards, he made his home in the Hôpital Pasteur, where the sisters of Saint-Joseph de Cluny, and Sister Laure in particular, served him with immense dedication. He died on October 29th, 1933, leaving a profound imprint on the Institute. A state funeral paid him a well-deserved tribute. Flowers are laid on his tomb, in the garden of the Pasteur Institute every year as they are on the tomb of Pasteur. Nicknamed “the lay brother,” Emile Roux, a complex personality, ascetic to the core, left a profound imprint on the first 50 years of the Pasteur Institute.

Jacques-Joseph Grancher: Rabies and Tuberculosis

Dr. Grancher is a perfect example of one of those great scientific figures, Pasteurians in particular, little known to the general public. His scientific work focused essentially on two diseases: rabies, which had haunted the popular imagination for centuries, and tuberculosis, a disease which in those days afflicted thousands, particularly among the poorer classes, and which literature and opera had seized upon (*La Dame aux camélias*, *La Traviata*, etc.), thus amplifying the terror it inspired.

Grancher was involved in the major event that was the first vaccination against rabies. Although his entire working life had been dedicated to tuberculosis, this striking parenthesis demonstrates his attachment to Pasteurian theories, his courage and his independence of mind. When

Pasteur inaugurated the Institute that bears his name on November 14th, 1888, Grancher was one of the five first heads of department, alongside Roux, Duclaux, Chamberland and Mechnikov. How did he get here?

Born in Felletin in the Creuse department in 1843, Grancher initially led the life of a young provincial, somewhat shy, the only son of simple and austere parents; his outstanding intellectual qualities, however, made him a brilliant pupil and resulted in his coming to Paris to study medicine. First a hospital extern and then an intern, he rose to become an associate professor of medicine. Specializing in respiratory diseases, he was by now a member of the Parisian medical elite, especially after his marriage to Rosa Abreu, heiress to a wealthy Cuban family whom he had met at one of the embassies to which he was often called in his professional capacity, he led a dazzling social life at their mansion on the rue Beaujon, entertaining writers and artists as guests. He was particularly close to Edmond Rostand, who was his patient. He had clearly made his way upwards in society.

Grancher's and Pasteur's paths crossed even before the two men actually met in person. Grancher was convinced that microbiology was the most promising approach of the late 19th century. At the start of his career, he sought to address the problem of tuberculosis from the standpoint of the histopathologist.

At the time, a great debate was raging as to whether pulmonary tuberculosis was single or dual in nature: "I do not think," he was to write later, "that any question in pathology has aroused so much passion in the medical world as that of so-called caseous pneumonia." German scientists had attacked Laennec's unitary theory, but Grancher ranged himself on the side of the unitarians and presented his thesis under the title *De l'unicité de la phthisie* (on the unitary nature of phthisis), demonstrating the analogy between the process of tuberculous granulation and the nuclei of caseous pneumonia. His thesis was both remarkable and convincing, and from this time forth Grancher would be considered a great specialist in respiratory diseases.

Koch's discovery of the tuberculosis bacillus in 1882 proved a breakthrough that inspired Grancher, who realized he now needed to learn all he could about experimental infectious pathology. He went knocking at the door of Pasteur's laboratory in rue d'Ulm, to ask for a place working alongside Chamberland and Roux with a view to studying experimental tuberculosis: he would be their disciple for five years, under Pasteur's

aegis, so convinced was he of the important role that microbiology would come to play in medicine. In *La Vie de Pasteur* (The life of Pasteur), René Vallery-Radot wrote: “Mr. Grancher used to work in the laboratory. Doctrine, new research, admiration and affection, all drew Mr. Grancher towards Pasteur who, for his part, appreciated and liked him.” Intellectual admiration for theories advanced by a chemist, not a physician, contested by a large proportion of the medical corps, and a real friendship for the man twenty years his senior brought these two personalities close together. In 1883, Grancher had been one of the members of the jury examining Roux’s doctoral thesis on the theme of advances in the knowledge of rabies. His inaugural address to the Chair of Pediatrics paid tribute to Pasteur’s ideas, and his would be the first medical department to meet the draconian rules of asepsis and antisepsis.

And so, on July 6th, 1885, it was only natural that Pasteur should call on Vulpian and Grancher to examine the young Joseph Meister. Both feared the outcome for the child without treatment would be fatal, and allayed Pasteur’s last remaining hesitations. The child must be vaccinated. Pasteur, not being a qualified physician, could not perform the vaccination. Vulpian recused himself, and it was Grancher who took the bold step. He carried out twelve injections in ten days. Meister’s life was saved. Patients flooded to rue d’Ulm from all over, and Pasteur put Grancher in charge of the vaccinations. Thus, he naturally found himself heading the vaccinations department at the new Pasteur Institute, which occupied the ground floor of the south wing. Given the times he lived in, Grancher’s great courage in this respect can only be admired. He believed utterly in Pasteur’s “method,” to the extent that, having accidentally pricked himself with the needle of a syringe containing virulent spinal cord material, he decided to self-administer the vaccine. When Loir, Pasteur’s nephew, doubted the wisdom of this procedure, he replied in glacial tones: “Young man, do you imagine I would do this job every morning if I were not sure of the method?”

On December 29th, 1885, Grancher was made Chevalier de la Legion d’Honneur and later Pasteur wrote: “With Dr. Grancher, whose dedication and zeal are beyond praise, we began the inoculations of the 350th patient.”

Grancher was thus a key player in a true scientific adventure. There followed a difficult period, when the death of the child Louise Pelletier signaled the start of a campaign against Pasteur, characterized by fierce criticisms and threats of legal action. Grancher was unflinching in his support

of Pasteur. In conjunction with Lannelongue, he founded *Le Bulletin médical*, which would defend the cause of the rue d'Ulm school elegantly and firmly. At the Académie, Charcot ended the controversy by praising Pasteur, and a contemporary wrote: "Pasteur invented vaccination against rabies. Vulpian and Grancher saved it."

Professor Grancher's absolute adherence to Pasteurian ideas and his real courage under difficult circumstances naturally led him to play an active part in the creation of the Pasteur Institute. He sat on the committee sponsoring the public subscription campaign launched by the Académie des Sciences. Pasteur entrusted him with the drafting of the Institute's internal bylaws and wrote to him on one occasion: "And so, due once again to your diligent and devoted efforts, the business of the bylaws is settled with the Council of State." He was made Officier de la Légion d'Honneur at the same time as Duclaux, on the day of the Institute's inauguration, November 14th, 1888. He served as secretary to the Board of Directors, then as Deputy Chairman and Chairman from 1905 until his death in 1907.

Tuberculosis continued, however, to occupy his thoughts, and he was convinced of the need for early diagnosis and the application of Pasteur's rules regarding hygiene and contagion. His central idea, drawn from Pasteur's work on the disease of silkworms, was that the best way of preserving a species threatened by a contagious disease was to protect its seed stock. It was with this in mind that in 1903 he founded a charity to protect children against tuberculosis, now known as the Oeuvre Grancher.

In conclusion, Grancher was a brilliant and fascinating personality. A great physician, open to new ideas, friend to writers and artists, a leading light on the Paris social scene, he also figured in public life, serving for four years on the town council of Cambo-les-Bains, in the Basque region, before being elected mayor in 1900. Above all, Grancher certainly occupied a key place in late 19th century medical life.

Ilya Mechnikov, a Colorful Personality

Ilya Mechnikov (Elie Metchnikoff in French) was one of Pasteur's first heads of department on the opening of the Institute in November 1888.

Born in Kharkov in 1845, he was a gifted child with a passionate interest in the natural sciences. He won a place at the University of Kharkov to study biology, but soon decided to leave and prepare his thesis in

Heligoland, whose rich fauna and flora attracted many naturalists, before moving on to Geneva and later Italy, at the urging of another young embryologist, Alexandre Kowalevsky. The two got on splendidly, and, Mechnikov, like Kowalevsky, was very much influenced by Charles Darwin's work, *On the Origin of Species*. Through their work on the embryonic layers of lower animals, one could say they laid the foundations for a new science: comparative embryology.

Returning to St. Petersburg, Mechnikov defended his thesis and, aged just 22, opted briefly to take up a teaching post. Then he left for Naples, stayed just as briefly, returned to Moscow, married and left for Madeira since his wife, who suffered from tuberculosis, could not tolerate the Russian climate. She died in 1873. This was a difficult and painful time for Mechnikov, who himself suffered from an eye disease that prevented him from spending long periods of time at the microscope. The atmosphere that prevailed in the universities of Tsarist Russia drove him away again, this time to Messina, where he was to make the hugely important discovery of phagocytosis – i.e. the reaction of mesodermic cells to an external agent, or the phenomenon of inflammation, which he considered beneficial since it helped to fight infection.

It was in the full glory of this discovery, for which he would receive the Nobel Prize, that he met Pasteur, who supported his theory of inflammation and welcomed the young scientist warmly, which Mechnikov appreciated all the more compared to the glacial reception he had received from Koch. It was to the Pasteur Institute, therefore, that he turned in October 1888, and there he would remain until his death in 1916.

Mechnikov continued to work on phagocytosis, engaging enthusiastically in debates on the subject, and the Pasteur Institute thus became one of the cradles of immunology. He was also interested in infectious diseases, moreover, and in intestinal flora, aging and “orthobiosis,” the ultimate goal of science, which should enable the human organism to enjoy wellbeing throughout its entire natural cycle.

Mechnikov was an original, brimming with curiosity. He came running from a far-flung corner of Europe, “face aflame, eyes bright, hair tangled, looking like the very demon of science,” as Roux described him. His laboratory spilled over with life and activity, and his reputation attracted young researchers, foreigners in particular, lured by such a rewarding atmosphere of enormous intellectual freedom and intense work. His

originality even prompted him to ask if his ashes could be placed in the Salle des Actes so that he could remain close to his colleagues and disciples forever! For 100 years, the urn containing his ashes has accordingly presided over all the great receptions and ceremonies held in this imposing room.

Emile Duclaux, the Successor

Although not such a colorful character, Duclaux nevertheless made his own mark on the Institute, particular in taking on the formidable task of succeeding Pasteur at the head of the Institute following the great man's death on September 28th, 1895. While he is not credited with any particular discovery, Duclaux was inseparable from all of Pasteur's work and complemented it by delving deeper.

Emile Duclaux was born in Aurillac (Cantal) in 1840 to a modest family. A gifted pupil, after passing his baccalaureate, he went to Paris to study for the entrance examinations to scientific academies. He was accepted by both the Ecole Polytechnique and the Ecole Normale Supérieure, but opted for the latter and graduated at age 22 with a teaching certificate in physics. He met Pasteur, who accepted him into his laboratory on rue d'Ulm, where he was to prepare his doctoral thesis and henceforth take part in Pasteur's work: the two men shared a mutual esteem and friendship. Indeed, it was Duclaux who penned the first biography of Pasteur. And it was under Pasteur's influence that he decided on the direction his scientific career would take, in this laboratory buzzing with enthusiasm and ideas.

Duclaux wrote:

We were poor, and put our trust not in ourselves but in him; those were well-spent hours when we watched him grappling with these difficult questions, forever searching, sometimes mistaken in the details and hesitant, sometimes triumphant and taking great strides forward. We did not always know where he was heading, since he did not say much, but we tried to guess, going by what came after the event and correcting our ideas against what we were permitted to see of his.

Furnished with his thesis, which had earned him a doctorate in physical sciences, he embarked on his university career and was appointed chemistry teacher at the high school in Tours. In 1886, he became deputy to the Chair of Chemistry in the Faculty of Science in Clermont-Ferrand. He was the youngest professor on the faculty.

Duclaux joined Pasteur during several stays in Pont-Gisquet near Alès, and took part, along with other young researchers, in the work on silkworm diseases. It was from their study of the silkworm farms that Pasteur and his colleagues gained their understanding of the principle of contagion and of hereditary transmission, a key stage in disease prophylaxis, and their study could be said to constitute the first experimental model of how to combat disease. Duclaux made some highly original observations, showing the influence of cold on the development of the seed.

Duclaux in turn played host to Pasteur in Clermont-Ferrand when the war of 1870 and the Paris Commune made it impossible for him to return to Paris. Pasteur conducted studies on beer that would be considerable assistance to the brewing industry. The resulting “*bière de la Revanche*” (revenge beer) in particular would help French brewers fend off German competition.

The diversity of Duclaux’s interests was remarkable. Ranging from phylloxera, for which he recommended planting vineyards in sandy soil, to milk and cheese-making (even setting up a dairy), to meteorology, Duclaux’s concerns were highly practical and had a direct impact on the business sectors concerned.

Taking over as director on the death of Pasteur, he would go on to develop the Institute. With the aid of generous benefactresses (the Baronne de Hirsch and Madame Lebaudy), he purchased a plot of land opposite the first building and had first the Hôpital Pasteur and then the Institute of Biological Chemistry built there. A man of liberal convictions devoted to the truth, Duclaux also spoke out in defense of Captain Dreyfus and contributed to the creation of the human rights organization La Ligue des Droits de l’Homme. (The Human Rights League)

The fifth department head, in 1887, was Charles Chamberland, a name little known to the general public. An invaluable colleague of Pasteur’s, and very closely involved with him in the work on rabies, he was noteworthy for his practical ingenuity and development of equipment such as the autoclave for sterilizing culture media and the candle-shaped porous ceramic filter. He founded the vaccines department on rue d’Ulm, which he later transferred to the Pasteur Institute and headed until his death.

Some less well-known Pasteurians

Leaving aside the scientific giants for a moment, let us turn to some less well-known but nonetheless interesting figures such as Adrien Veillon, one of the first heads of department at the Hôpital; Edouard Pozerski de Pomiane, surely better known as a gastronome than as a Pasteurian physician; or Louis Rapkine, a splendid figure who did so much for French scientists during the Second World War.

In the first years of the Hôpital, one figure that stands out is Adrien Veillon (1864-1931), assistant to Louis Martin, who would be in charge of one of the pavilions for thirty years and had been one of those who watched over Pasteur during the winter of 1894. Veillon, dismissive of all honors, inclined to rebel against authority, a man of great modesty, full of good sense and unequalled goodness, had little love for those running the Institute and reserved all his kindness for his patients. Reilly describes him as one of the most likeable of characters:

What was most striking about his face, framed by a pointed beard and topped by a bare skull, was the acuity of a somewhat mischievous gaze... The spirit of independence incarnate, Veillon took care to respect it in others, even if inconvenient to himself... He retained from his youth a love of whimsy, joviality and a sense of humor. He was also an astute and well-informed clinician.

In reality, Veillon was a master and a pioneer in the field of anaerobic bacteria. A bacteriologist by training, he specialized first in putrid and gangrenous suppurating wounds, for which the wounded of the First World War provided plentiful matter for study.

Edouard Pozerski de Pomiane (1875-1964) was an atypical Pasteurian. His parents had fled Poland after the 1863 revolution and lived in poverty in Paris. Their son Edouard, born in 1875, set out to pursue a scientific career. He took his bachelor's degree in natural sciences and returned to the Sorbonne to volunteer in the laboratory of Professor Dastre, a former student of Claude Bernard, and gave mathematics lessons to make a living for himself and for his destitute parents. When a research assistant post became available in the Physiology Department, Pozerski was warmly received by Duclaux and Camille Delezenne, the head of the department in which Pozerski would prepare his doctoral thesis. Soon afterwards, Duclaux, who knew that Pozerski took part in the "people's universities," asked him to give lectures to the general public on the work of Pasteur and

the Institute. He thus made a name for himself as a likeable popularizer, even before his work on intestinal and pancreatic juices and on digestive enzymes led him into the fields of cookery for Pasteurian meals and into gastronomy for a wider public.

Undoubtedly gifted at interacting with colleagues and fellow scientists, he hosted Pasteurian meals and began writing cookery books, *Bien manger pour bien vivre*, *essai de gastronomie théorique*, *Cuisine et Restrictions*, and *Des honnêtes voluptés de bouche et d'amour*, unusual titles to find among the works of Pasteurians, but which made their mark on the world of gastronomy. Founder of the National Gastronomy Committee, Pozerski also wrote *Souvenirs d'un demi-siècle à l'Institut Pasteur*, where he described his “fraternal colleagues” from across a half-century at the Institute in the warmest of terms, clearly viewing them in an affable and benevolent light, which is most unusual!

Closer to us in time, but scarcely known outside the circle of the students of François Jacob and Jacques Monod, is the fascinating figure of Louis Rapkine (1904-1948). Born in Russia in 1904, he came to France with his family and then left again for Montreal, but returned to pursue his studies



Research work on tuberculosis performed by laboratory technicians, Pasteur Institute, around 1930.

in biochemistry in Roscoff and then at the Ecole des Hautes Etudes and the Institut de Biologie Physico-chimique. Apart from his passion and talent for science, Rapkine's primary concern was helping others. The war offered him an ideal opportunity since, as the first Free French scientist, he realized as early as June 1940 the need to help his fellows. He left for the United States and devoted all his energies to saving numerous French scientists and helping them get to America. Many saw him as some sort of magician who managed to obtain authorization for them to leave France and then gathered them together as the Scientific Mission of Free France, first in New York and then in London. His never-failing determination, his efficiency and his innate kindness left many with unforgettable memories of him.

No praise is too high for Rapkine's work, [wrote Frédéric Joliot-Curie.] Science owes him a great deal, not only for his own work, particularly on chemical reactions associated with cell division, but because of his role as apostle... How many scientists owe their life to him! He succeeded in obtaining papers, contracts, jobs, laboratories, asylum for them, he helped them across dangerous borders.²⁴

For Maître Suzanne Blum, attorney to the Duchess of Windsor, who had known him in New York, Rapkine was quite simply a saint.

His life was cut short when he died at the age of 44 from lung cancer. His influence was enormous. Thanks to his contacts with foundations in the United States, the Rockefeller Foundation in particular, Louis Rapkine did a great deal in the immediate aftermath of the war to ensure that French laboratories, including those of the Pasteur Institute, received American funds to help them rebuild. The Rapkine French Scientist Fund, created specifically in his memory, receives such funding.

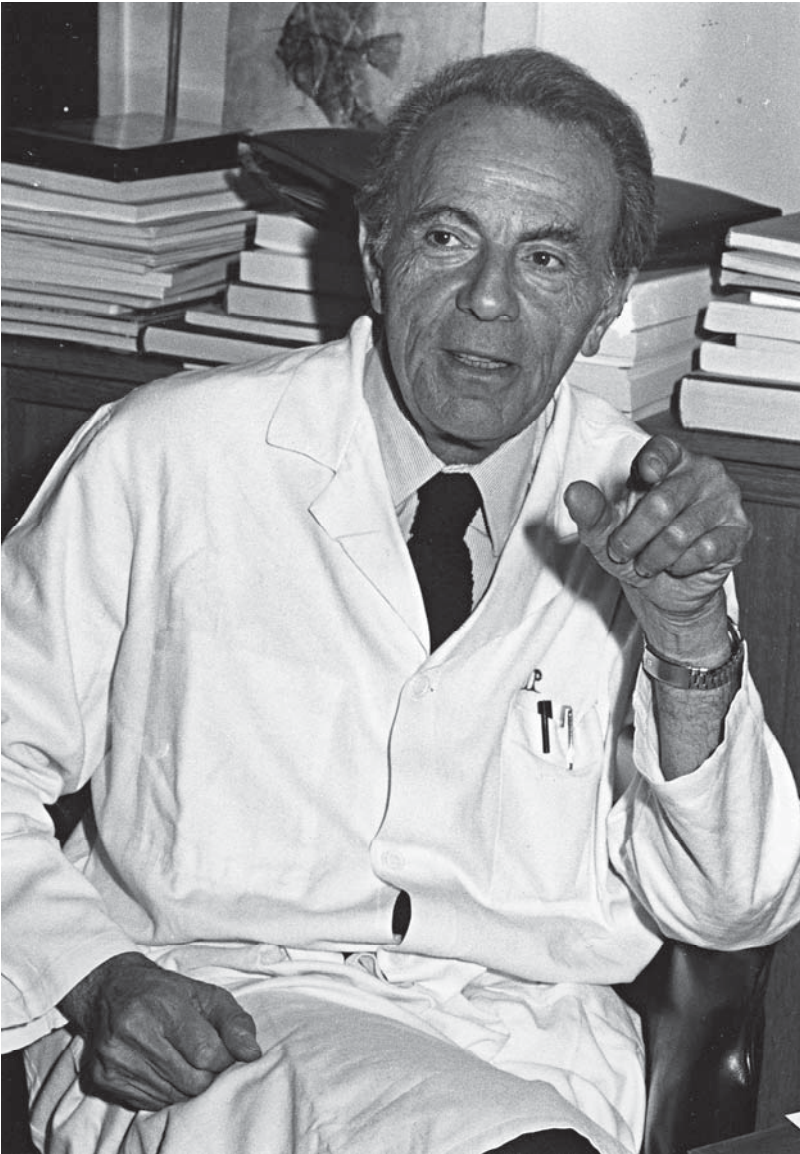
And who is today's Pasteurian?

For many years, a painting by François Jacob used to hang in the office of the President of the Pasteur Institute, representing a gaunt beggar, clad in rags, holding out a begging bowl to a hypothetical donor. François Jacob had entitled the painting *Le Pasteurien du XXI^e siècle* (The Pasteurian of the 21st Century). Although not (yet?) a beggar, today's Pasteurian nonetheless hunts for contracts and donations. It is part of the job description, because budgets keep getting tighter and scarcer, and researchers are forced to circulate their research projects to all the leading foundations and potential donors. Often, a unit's budget is calculated on

the basis of the external contracts it has won. Researchers who fail to bring home the contracts see their resources shrink. On the other hand, those prominent figures who are the Institute's "great" researchers, those who win numerous contracts and the international prizes that make it easier for them to win more contracts and whose reputation ushers them into the Collège de France or the Académie – comprise a small group which seems to uphold the reputation of the Institute and only occasionally concerns itself with internal problems. They are figures of authority in the public sphere, stand out by virtue of their extensive knowledge and openness of mind that extends far beyond the laboratory: in the 18th century, they would have been those enlightened humanists with all of the science of their time at their fingertips. The Pasteur Institute has always allowed such great intellectuals to flourish and to enrich those around them.

Now is perhaps the moment to mention the Nobel Prize, since ten Pasteurians have been so honored since the founding of the Pasteur Institute. Some have already been mentioned - André Lwoff, Jacques Monod and François Jacob in 1965, Luc Montagnier and Françoise Barré-Sinoussi in 2008. They followed in the footsteps of Alphonse Laveran in 1907 for his work on the role of protozoa in the causation of disease, malaria in particular, Ilya Mechnikov in 1908 for his work on immunity, Jules Bordet in 1919 for his discoveries of the role of antibodies and Daniel Bovet in 1957 for his discovery of antihistamines and synthetic curariform drugs. The century has thus been marked by these major scientific successes and the powerful personalities of those responsible for them, all which have contributed to the reputation of the Pasteur Institute.

On that front, the outstanding figure of François Jacob has long been identified with the Pasteur Institute. A poignant ceremony in which he received full military honors was held on April 24th, 2013, only a few days after his death, in the courtyard of the Invalides, in the presence of the President of the Republic. How to sum up this extraordinary figure in a few short words? A member of the Resistance as early as June 1940, an army doctor fighting under General Leclerc, severely wounded in combat in August 1944 (he bore the painful traces of submachine gun bullets for the rest of his life), a "Compagnon of the Libération," eminent researcher and Nobel laureate, Chairman of the Board of Directors of the Pasteur Institute from 1982 to 1987, talented writer, member of the Académie Française... the many facets of François Jacob speak for themselves in the splendid memoir he wrote in 1987, *La Statue intérieure*. At the same time,



François Jacob in 1985. Nobel Prize for medicine in 1965, Chairman of the Board of Directors of the Pasteur Institute from 1982 to 1987.

he had a great sense of humor and readily compared himself to Charlie Chaplin (“The way I see myself, it was like Chaplin in the science lab!”), and he was a pleasure to work with.

Despite never winning a Nobel Prize (although it was said that he would certainly have, had he continued working with François Jacob), Elie Wollman stands apart. After publishing, with François Jacob, the famous article on bacterial sexuality, he spent time in the United States, which sent him off in a different direction. On his return, he did not rejoin the Monod-Jacob team and their paths diverged. He never received the honors that were heaped on François Jacob, and he refused to take on the position of director of the Pasteur Institute, a place to which he was nevertheless viscerally attached. A caustic sense of humor, a mind as sharp and cutting as a diamond, in fact, concealed a most sensitive human being. A man who had no hesitation in making fun of Institute directors he disliked was bound to fare better in the role of critical analyst than that of constructive manager. He believed that directors of the Institute could ignore ministers, and made it a point of honor that President Valéry Giscard d’Estaing bestir himself and come to the Hôpital Pasteur to pin the Legion of Honor on Sister Laure on her 100th birthday. He categorically refused a ceremony at the Elysée Palace, and then insisted that a bouquet of flowers should be presented to that same Sister Laure on the anniversary of the death of Dr. Roux. As a young researcher, he was constantly in the laboratory and never took holidays, until the day he told André Lwoff: “I will be away for five days, starting tomorrow,” to which Lwoff simply replied, raising his eyes, “Getting married?” – “Yes, sir.” Elie Wollman’s penetrating intelligence, his sense of history, his attachment to the Institute and, above all, to the hospital with which he associated the tragic memory of his parents, his criticisms of any inappropriate passing fad or modernity for modernity’s sake, his enlightened advice to many a young researcher, made him an unforgettable member of the Institute.

Then there are also the Pasteurians that the general public will never hear about: the specialist in bacterial taxonomy, who can discourse ad infinitum on unclassifiable strains; the expert in mosquito reproduction; those working in laboratories certified as centers of reference; those in charge of collections who, working in the shadows, focus on the characterization of difficult bacterial strains and provide the Institute with the skills and knowledge upon which the field of microbiology is based.

And now a word about women: when I arrived at the Pasteur Institute in 1983, female heads of unit could be counted on the fingers of one hand: Agnès Ullmann, Antoinette Ryter, Madeleine Sebald, Germaine Stanier, and Marie-Anne Bach. Today, they are far more numerous, some with undisputed international scientific reputation, and 60% of the Institute's staff is female. Alice Dautry became the first woman to be appointed President of the Institute in 2005. Some women made quite an impression, such as Marguerite Faure, known for her strong character, who reputedly slapped Jacques Monod's face for daring to pat her on the rear (unless it was the other way around!).

Then there are the Pasteurians out in the field, who still exist to this day. Some spend their whole career in the Pasteur Institutes overseas and can sometimes feel very removed from management in Paris. Working on enteropathogenic bacteria, the Ebola virus, AIDS, they participate in epidemiological monitoring, developing methods of rapid diagnosis and treatment best suited to developing countries. Like Indiana Jones, they are confronted by devastating epidemics during their epic missions to the villages. During an outbreak of hemorrhagic fever, one Cameroon Pasteur Center team arrived at night in a village that had already suffered around 50 deaths and where dozens were sick. The resurgence of cholera, epidemics of meningitis and the Ebola virus have done more than their fair share to mobilize Pasteurians in the field, sometimes at the cost of their lives.

At the risk of raising a smile, there are also the rare occasions when, Pasteurians take themselves for Pasteur! Eyes shining, blazing with excitement, they believe they have come upon a research result that has set them on the path to a great discovery. For days, they are treated with careful consideration by some, amused irony by others, as they insist upon calling a press conference. Management has to be called in to contain this ardent desire to communicate the mighty news to the media right now, this minute for fear of being scooped; in the most serious of cases, they are convinced they are about to be put forward for honors, until the balloon bursts and these candidates for fame slip back into the silence of the laboratory, though that sweet taste of glory, however fleeting, will never be forgotten!

As we have seen, Pasteurians are often atypical. They may also be dogmatic, unfair in the eyes of those who are not of their clan. But they are, above all, passionate spirits engaging in what, in the current climate of

international competition, is a stressful profession. Ultimately, it is probably the passion for science that is the most entrenched characteristic of the Pasteurian. When this is coupled with a complex attitude toward authority, the director's job is rarely an easy one.

At a time when such highly specialized research tends to confine researchers within the limits of their subject, it is important for Pasteurians to keep the open mind and the broad taste for general knowledge and culture that has always defined the most illustrious of them.

EMERGENCE OF THE PASTEURIAN COMMUNITY AROUND THE WORLD

“We need to train within our establishment young scientists who will go out and take our method to distant countries.”

Louis Pasteur

The “French Doctors” of the Late 19th and Early 20th Centuries

Following his studies on virulent diseases in our temperate climates, Pasteur planned to extend his research to the diseases of hot climates, a particularly visionary approach in the light of the public health problems facing us today, and one that would give rise to an extraordinary adventure that would carry his name to the four corners of the earth. Too little of this adventure is known to most French people, apart from the military personnel who served in Africa or Indochina, especially its doctors and nurses who were often very close to the Pasteurians on the ground. These Pasteurians, often military medical officers themselves, who served in the tropics, were adventurers. They have made splendid contributions to improving public health around the world and to the reputation of France, ever since the days of the Third Republic. We should honor the courage of those who were prepared to venture into such remote and often inhospitable lands. Dr. Digoutte recalled, for example, that before the Pasteurian era, “sleeping sickness was endemic throughout Senegal and, every eight or ten years or so, yellow fever would wipe out whole urban populations with mortality rates reaching 80%.”²⁵

These Pasteurians of the tropics, these “French Doctors” of the 19th century should be thanked for the eradication of smallpox in Madagascar, the virtually total disappearance of sleeping sickness from Cameroon, the lives saved by the plague vaccine in Madagascar or by antivenin serum in Indochina.



Map of the International Network of Pasteur Institutes.

Yet not one mention is made of this in, for example, Malet and Isaac's 1930 textbook on contemporary history destined for high school philosophy and mathematics courses. A substantial chapter is devoted to colonial expansion under the impetus of Jules Ferry.²⁶

The same absence is to be noted in the 1937 history textbook for the upper primary school classes, where Pasteur's work does, of course, receive a mention in the chapter on the intellectual movement in France since 1848:

A scientific genius, perhaps the greatest scientist of the 19th century, he produced a vast and fertile body of work... Pasteur's work has had incalculable beneficial consequences. The Pasteurization processes are now applied universally. Pasteur Institutes have been founded in every country to combat infectious diseases according to the master's methods.²⁷

The chapter devoted to the forming of a new colonial empire pays no mention, however, to the creation of Pasteur Institutes in the newly conquered countries: Indochina, Madagascar, Senegal. In this way a brilliant part of Pasteur's work remained in the shadows.

In the annual chronicle of key dates in the history of the Pasteur Institute, the entry for February 22nd, 1893 reads: "Pasteur announces the creation

by certain of his colleagues of laboratories in Brazil (Le Dantec), Siam (Yersin), Saigon (Calmette), Calcutta (Haffkine) and Sydney (Loir).” The following year, 1894, saw the creation in Algiers of a rabies treatment laboratory under the aegis of the Pasteur Institute, and Yersin’s creation of a laboratory in Nha Trang. This marked the beginning of what were initially known as the Overseas Pasteur Institutes (IPOM), and later the International Network of Pasteur Institutes and associates (RIIP).

Pasteur Institute initiatives at the end of the 19th and beginning of the 20th centuries were characterized by a combination of one-off missions and the creation of permanent establishments. In 1883, Pasteur sent Roux, Nocard, Straus and Thuillier to Alexandria to study the cholera epidemic then raging in Egypt. Louis Thuillier died there, at the age of 26, after contracting the disease. It was Koch’s team that pushed ahead of the Pasteurians to discover the cholera vibrio, but the drive was already there. As early as 1886, Pasteur himself had said:

It is therefore certain that, for France, one establishment [the Pasteur Institute] may suffice. For South America, Chile, Brazil, Australia, we will obviously need to train at the Paris establishment young scientists who will go out and take the method to these far and distant countries.

The success of Calmette and Yersin in Indochina would swiftly open the way to other missions. Paul-Louis Simond in India in 1897 would discover the role of fleas in the transmission of plague; the brothers Edmond and Etienne Sergent in Algiers conducted a prophylactic campaign against malaria; while Emile Roubaud and his colleagues studied sleeping sickness on a mission in Senegal. In the early 1900s, Emile Marchoux and Alexandre Salimbéni spent several years on a mission in Brazil to study the yellow fever epidemic.

Over and above these various missions, the first Pasteur Institutes overseas sprang up, one after another. In 1893, Pasteur sent his nephew Adrien Loir on a mission to Tunis to prepare the rabies vaccine and to set up a laboratory to study the fermentation of grape juice. From this initial mission would emerge the Pasteur Institute in Tunis, of which Charles Nicolle would become the director in 1902.

In 1898, faced with the ravages of plague, smallpox and rabies, General Galliéni, governor of Madagascar, no sooner arrived on the island than he set up an institute to produce vaccines and treat rabies, under the management of André Thiroux, a member of the army medical corps and

former student at the Pasteur Institute. The institute would become a subsidiary of the Pasteur Institute in 1927. Thiroux immediately embarked on the production of smallpox and rabies vaccines and succeeded in eradicating smallpox from the island, where the last case was recorded in 1914.²⁸ In addition, Girard and Robic²⁹ developed a plague vaccine to eradicate pneumonic plague, the effects of which were equally spectacular.

In 1908, Roubaud's mission resulted in the opening of the Pasteur Institute of Brazzaville, which became a center for the study of human and animal trypanosomiasis and their pathogens.

In 1913, the Pasteur Institute of Dakar opened its doors, following in the footsteps of the first African microbiology laboratory opened in Saint-Louis du Sénégal in 1896. It specialized in the study of the amaranth or yellow fever virus and in the production of a yellow fever vaccine, work that it continues to this day, supplying the African continent via the World Health Organization (WHO).

In Algeria, it was in 1894 that two professors from the Ecole de Médecine, H. Soulié and J.-B. Trolard, opened the Pasteur Institute in Algiers to treat rabies and smallpox. In Morocco, in 1913, Marshal Lyautey called for the opening of a Pasteur Institute in Rabat and then in Tangiers (1913) and in Casablanca (1914), where Paul Remlinger headed the Pasteur Institute of Morocco until 1958, focusing particularly on rabies.

Hygiene and prophylaxis laboratories in Cayenne (French Guiana) and Pointe-à-Pitre respectively became the Pasteur Institute of French Guiana (1940) and the Pasteur Institute of Guadeloupe (1924). The first concentrating on infectious, parasitic and fungal diseases and the other on leprosy and on the eradication of malaria in the French West Indies. More recently focus has been placed on the epidemiology and monitoring of dengue fever.

Cameroon, Guinea, and Zaire would also see the opening of Pasteur Institutes, as would the Central African Republic, where the Bangui Pasteur Institute was opened in 1961.³⁰

Closer to home, the Pasteur Institute of Greece was created in 1919 thanks to a donation from Sir Basil Zaharoff. In 1920, a Pasteur Institute was opened in Teheran at the request of the Iranian government, and was headed by J. Mesnard.³¹

The Louis-Malardé Institute in Tahiti (1949) and the Pasteur Institute of New Caledonia (1913) can be added to the list, and it is easy to understand how Pasteur's name became known throughout the world. Many dispensaries or laboratories bore the name of Pasteur, for however long or short a time, in the years that followed the first rabies vaccination, in New York, Buenos Aires, Istanbul, Coonoor (India), Australia, etc.

Pasteur liked to say to his students: "You will see how all this will grow in time." This Pasteurian epic had its heroes: Calmette, Yersin, Nicolle, the Sergent brothers, Paul-Louis Simond, to name only a few. Who today even in France, among the general public, is aware that these men played an important role in improving public health in the countries to which they were posted? Personal glory was sometimes of very little concern to them. Yet their memory remains alive among the people of Madagascar, of Vietnam or of Iran rather than at home, and their names continue to command respect despite the vicissitudes of the political relations between these countries and France.

A handful of figures – Albert Calmette, Alexandre Yersin, Charles Nicolle – now spring to mind. They illustrate the impact of the Pasteurian community around the world.

Albert Calmette and the first Pasteur Institute Overseas

It was to Calmette (1869-1933) that fell the honor of creating the first Pasteur Institute overseas to use the expression of the time. This was in Saigon in 1891.

The Under-Secretary of State for the Colonies was keen to see the creation "in our colony of Indochina, of a laboratory to prepare the smallpox vaccine and to carry out rabies vaccination." Rabies-infected patients could not get to Paris in time for treatment to be effective and therefore most died. In December 1890, Pasteur called in Calmette, a physician with the colonial medical corps and an assiduous student of the Pasteur Institute course, to ask if he would agree to go out to Indochina to organize a laboratory.

Calmette agreed and set off to establish the Pasteur Institute of Saigon. As a young naval doctor, dreaming of far horizons, Calmette had served in the Far East squadron commanded by Admiral Courbet and was the ideal choice for the mission Pasteur was proposing.

Its sanitation much improved by French urban planners since Calmette's first tour there in 1884, Saigon was a pleasant city, and the Calmette family slipped easily into the colonial lifestyle: contacts with the naval doctors serving in Saigon's medical department, explorations of the tropical forest at the gates of the city, balls at the Governor's residence, carriage rides in a Victoria driven by a Malay coachman, warm evenings on verandas festooned with bougainvillea, flame trees and hibiscus. But Calmette also encountered the local medicine, far removed from Pasteurian practices, and infectious diseases, of which there was a wide choice: malaria, cholera, dysentery, etc.³²

On his arrival, Calmette set up a laboratory in an outbuilding of the military hospital. His first task was to develop smallpox vaccination: smallpox took a heavy toll in Indochina, as it did throughout the Far East, and it was important to be able to prepare a vaccine locally in the proper conditions of efficacy and conservation. He developed a high-quality vaccine made from water-buffalo lymph, and five hundred thousand natives were vaccinated in the space of two years. Smallpox was conquered, not only in Indochina, but also in the neighboring countries of South East Asia, as it proved possible to transport the vaccine without loss of potency.

Another problem that needed to be tackled was rabies, very prevalent due to the many rabid dogs running free. Calmette was determined to improve the technique for conserving the rabbit spinal cord used in the manufacture of the vaccine, and managed to do so by using glycerin. The "method" was widely applied in Indochina. Smallpox and rabies, two local scourges, were defeated for the first time. Calmette developed a fascination for the snakes that swarmed everywhere in Indochina, and particularly for cobras, and studied in depth the physiology of different types of venom and their action on humans and monkeys. He produced an antivenin serum that proved to be effective if administered soon enough after the bite.

Through the broad scope of his work, Calmette mapped out the Pasteurian program for future Institutes and demonstrated the services that microbiology could offer a country. He steered the Pasteur Institute of Saigon towards the organization of practical departments capable of handling the diagnosis and preventive treatment of infectious diseases; after that, experimental research was carried out into local diseases (malaria, plague, cholera, etc.). This program was supplemented by the monitoring of water supplies and food.

All this work concentrated on local needs earned Calmette the trust of the local populations, and it was no accident that Calmette's name, along with those of Pasteur and Yersin, would remain in the streets of Ho Chi Minh City long after the French left.

Alexandre Yersin, the “conqueror of the plague”

Calmette's example was soon followed by Yersin's (1863-1943). A somewhat mysterious character, unknown to the French public despite making a major discovery at age of 30; he was discreet, unimpressed by and even averse to honors, yet he remains regularly celebrated in Vietnam even now, almost 75 years after his death. His is one of the most striking and appealing figures in the entire Pasteurian saga.

Swiss in origin, from the region of Morges in the canton of Vaud where he was born in 1863, Yersin had an austere childhood and received a puritanical education. He decided to study medicine, beginning in Germany, in Marburg, before continuing his studies in Paris, where he arrived in 1885. In 1887, he joined Grancher's laboratory at the Hospital for Sick Children and at the same time became a research assistant to Roux. He worked with Roux on diphtheria and tuberculosis, on the latter of which he wrote a medical thesis that gained widespread notice, such was the importance of the disease for the field of infectious pathology of the late 19th century. In December 1888, their major work on diphtheria, another disease that took the lives of many children, was reported in the *Annales de l'Institut Pasteur*.

Research assistant and Dr. Roux's teaching assistant for the technical microbiology course, Yersin experienced the first years of the Pasteur Institute alongside the two larger-than-life figures of Pasteur and Roux. Like some of the other research assistants, his room was on the 2nd floor in the corner of the building. As Roux's health failed, however, the burden of teaching, which he did not enjoy, lay heavy on Yersin's shoulders, and he began to feel stifled within the narrow walls of rue Dutot. A desire for distant horizons gradually took possession of him and, to Roux's great



Alexandre Yersin at the entrance to his straw hut in Hong Kong, in 1894.

surprise and incomprehension, he took a decisive step to change the course of his life by applying to the Messageries Maritimes shipping company for a post as ship's doctor.

On September 21st, 1890, Yersin set sail aboard the *Oxus*, a steamer carrying 400 passengers bound for Saigon. In the course of successive postings, he visited the Far East, the coastlines of Tonkin, the Philippines hinterland when sailing the Saigon-Manila line, the Annamite Range and, from one port of call to the next, he acquired a taste for exploring places where few French, or indeed few Westerners at all, had hitherto set foot. It was in the course of his travels that Yersin visited Saigon and met Calmette, who had just opened the first Pasteur Institute overseas. A taste for exploration won out over love for the high seas, and Yersin left Messageries Maritimes to embark on an exploration of the Indochinese hinterland. He learned astronomy, meteorology, and photography. He set out to explore Annam, located the sources of the Dong Nai river and discovered the airy, healthful plateau on which the town of Dalat would later be built. Paul Doumer, then Governor General of Indochina, was keen to establish a healthy hill station for French colonists "fatigued," it was said, "by the colony's climate." Yersin's scientific rigor and

observation, coupled with his intellectual curiosity about local populations and his taste for map-making and route planning, proved essential. This ensured that the missions he undertook for another Governor General of Indochina, Mr. de Lanessan, did much to advance knowledge, planning and development of the protectorate.

Yersin's explorations took place in an environment now long forgotten: tigers prowled around the camps, the paths were steep and soaked by incessant rain. His socks were often filled with leeches, so Yersin frequently went on his way barefoot, as do the Annamites or the Moi. He had no fear of the raiders, Chinese or Annamite, who rushed down from the mountainsides to put villages to the torch, and was ready to fire on them if necessary. He made contact with local tribes, palavered with village chiefs, settled disputes, and won the respect of all.

Then yet another break with the past led him to resume his initial vocation of physician and researcher. The dark shadow of the plague, spreading across Yunnan province and making its way into Canton and Hong Kong, would give Yersin the chance to make a major discovery.

Since the start of the 19th century, the plague had gradually spread through the south of China, in Yunnan province in particular and, now endemic, it posed a threat to Tonkin. As Henri H. Mollaret and Jacqueline Brossollet noted in their book on Yersin,³³ he proposed to the Governor General that he visit Yunnan to study the outbreak at its source and determine how best to combat it, to which the Governor had replied: "There has never been plague in Yunnan, and were there to be, I should deny it; this poor Tonkin already has enough to bear without adding plague to its burdens!" At the beginning of 1894, however, the epidemic intensified and the situation in Canton and Hong Kong was becoming dramatic. Over a hundred thousand deaths were reported in the port of Canton alone. Given the scale of the threat, the French government asked that Yersin be sent to Yunnan as soon as possible.

This terrible disease, [he wrote to his mother,] exists sporadically in Yunnan, but a violent epidemic broke out this year. Tonkin is under threat. That is why they are sending me there. The epidemic has spread to China this year. In Hong Kong, they are reporting forty deaths a day. My idea is to go there first to begin my work. All will depend on the Governor.

After a number of administrative difficulties and thanks to Calmette's remonstrances to the Minister, Yersin finally received permission to leave

for Hong Kong, where he arrived on June 15th, 1894. The city was in the grip of an epidemic and a desolate sight stretched before his eyes:

Every day, more bodies are found in the countryside or on the sampans; hastily improvised cemeteries are in fact merely simple burial pits into which the bodies are thrown with quicklime and covered by a slab of concrete. Death occurs within a matter of days from onset, sometimes even in less than twenty-four hours, and the mortality rate is approaching 96%. Every day, three hundred British soldiers visit all the houses of the Chinese and take the sick to one of the hospitals. If three cases have broken out within a single family, the survivors have twenty-four hours to move out, and then the house is stripped of whatever remains, doors, partitions, anything left behind, rubbish, everything is piled up on the shore and burned. Then the walls and roof of the house are sprayed with chlorinated lime and sulfuric acid. Some streets, where almost all the homes have held plague victims, have been walled off at each end.³⁴

Yersin needed access to the cadavers, but the British were unhelpful as they perceived the official presence of a French bacteriologist as a form of criticism, and instead favored the Japanese mission headed by Dr. Kitasato. He made an untimely announcement that he had isolated the plague microbe from the blood of the sick, but this was to prove incorrect. Yersin, for his part, took multiple samples from blood but never found anything; from this, he deduced that the mystery must lie in the bubo, the lesion characteristic of plague. Heaven was on his side, in the form of an elderly Italian missionary, Father Vigano, who had been awarded the Légion d'Honneur at Solférino and who remained a staunch Francophile to the end! Thanks to him, and to the judicious distribution of a few welcome coins to the English sailors ordered to bury the bodies, Yersin was at last able to analyze the buboes in which, he believed, the plague microbe was to be found. In scarcely more than a week, Yersin had found the same bacillus in all the buboes he examined and, at the end of June, he wrote a letter to Duclaux in which he gave an initial description of the plague bacillus.

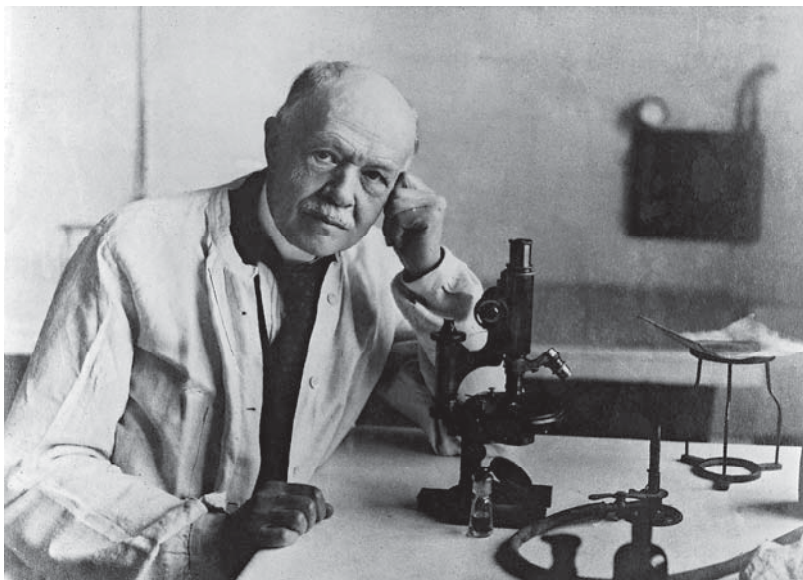
In the harshest of working conditions – minimal facilities offered by a laboratory hastily installed in a straw hut, with only a microscope to aid him — Yersin succeeded in identifying the plague bacillus, subsequently named *Yersinia pestis*. He would also point out the role of rats, hitherto wholly unknown, in the epidemiology of the disease. Yersin left Hong Kong as discreetly as he had arrived, and returned to Indochina, to Nha Trang, where he would remain until his death in 1943.

He founded the Pasteur Institute of Nha Trang and began to plant rubber and cinchona trees to contribute to its funding. *Hevea brasiliensis*, better known as the rubber tree, was practically unknown in Vietnam at this time. Yersin was fascinated by its cultivation, which he developed on the Suoi Dau farm, where the climate and the soil proved favorable. An area of up to 300 hectares was planted. In spring 1905, the first harvest resulted in the sale of 1,316 kg of latex to the Michelin company. Between 1930 and 1944, the farm exported over 100 million tons. Yersin also grew cinchona trees, which would guarantee Indochina sufficient quantities of quinine during the Second World War. He paid considerable attention to training local managers and founded Vietnam's first faculty of medicine.

A simple, modest man, Yersin was very close to the Vietnamese and the villagers of Nha Trang, whom he treated with great generosity. His knowledge of astronomy and climatology meant that he was able to warn local fishermen of approaching cyclones. Known as Mr. Five or Mr. Ong (referring to his medical officer's stripes), he led the simplest of lives. He refused to be photographed, compliments were painful to him and honors of no interest to him whatsoever.

All of which explains the extraordinary way that Yersin continues to be remembered, venerated in Vietnam, and the veneration in which he is held to this day. The Association of Admirers of Yersin was founded in Vietnam in 1990, and was officially recognized by the Vietnamese Government in 1992 at its first congress. In 1991, to mark the 100th anniversary of the Pasteur Institute in Saigon, an international seminar on Yersin was held in Nha Trang to "extol his eminent merits and his noble humanism." A museum dedicated to Yersin was founded there³⁵, thanks to Pasteur Institute funding. 70 years after his death, Yersin is still revered even now as a saint, a bodhisattva. Flowers are regularly laid on his tomb, at the foot of a pagoda, in this beautiful hilly landscape that he loved so much, and incense is burned there every year on the anniversary of his death.

Clearly, he was an exceptional character, but for some paradoxical reason, he remains relatively unknown, even in Hong Kong. This explains why the Pasteur Institute decided to mount an exhibition in his honor in 2008, on the occasion of the 145th anniversary of diplomatic relations between



Charles Nicolle in his laboratory at the Pasteur Institute in Tunis, around 1935.

France and Hong Kong. A bust of Yersin was placed in the delightful medicinal herb garden that surrounds the Museum of Medical Sciences, a period house dating from colonial times in Hong Kong's Mid Levels. Yersin's memory now lives on here, as it deserves to be fitting.

Charles Nicolle and the Tunis Institute

Now we turn to the shores of the Mediterranean in order to discover another great Pasteurian, Charles Nicolle (1866-1936), as devoted to Tunisia as Yersin was to Indochina:

I have visited other countries that I admired and whose memory charms and haunts me. This country, Tunisia, touches me to the very depths of my soul. I find myself in it and, just as in the odd corners of my old native town, the tiniest details are part of me.³⁶

It was a combination of disappointment with the progress of his career in Rouen and circumstances (the need to replace Adrien Loir as director of the Pasteur Institute of Tunis) that brought Nicolle to Tunis. The son of a doctor who had decided that both his sons would also be doctors, Charles

was actually torn between a literary career and a career in medicine. The latter was to earn him a Nobel Prize but, in addition to his scientific writings, he managed to leave behind a literary legacy of novels and short stories that, however, did not sell.

Following in the footsteps of his brother Maurice, whom all described as dazzling, Charles Nicolle proved a great scientist, trained in the Pasteurian imagination and rigor of Mechnikov and Emile Roux.

After a disappointing early experience in Rouen due to the hostility of certain local physicians who opposed his Pasteurian innovations, Nicolle seized on the vacancy for the post of director of the Pasteur Institute of Tunis as the means to escape from a blinkered provincial atmosphere:

Farewell, dear hospital, farewell Rouen, epic city that you are, farewell friends, long-cherished projects, farewell my little laboratory; a beginner's efforts could not suffice in so short a space of time to shake so ancient a resistance. I must carry these gods, my hopes, elsewhere.³⁷

At the end of December 1902, Charles Nicolle arrived in Tunis to take over at the Pasteur Institute, where he would remain until his death in 1936. He was constantly out in the field exploring the country in detail, taking an interest in all its diseases: trachoma, bilharzia, malaria, leishmaniasis, brucellosis and, of course, typhus. He crisscrossed Tunisia, from watercourses to marketplaces, armed with a “mini-laboratory” to track down viruses and microbes even if it meant ending up at the patient's bedside. Nicolle was “lucky” enough to encounter an outbreak of typhus in the south of Tunis. By dint of rigorous observation of the sick, reflection on transmission routes and reliance on his intuition, he identified the louse responsible for the propagation of typhus. The progress of the disease stopped at the hospital doors once the patient was taken in, washed, changed into clean clothes, etc. Nicolle deduced that something had been eliminated at this point: “It could only be the louse. It was indeed the louse.”

This discovery, which was to earn him the Nobel Prize in 1928, gave him an opportunity to address the epidemiology of the disease, and to take a more general approach to the specificity of infectious diseases demonstrated by Pasteur, that each disease has its corresponding microbe. Nicolle showed that a disease could be caused by different pathogens and that, conversely, one pathogen could give rise to different diseases, reaching the conclusion that the only factor specific to a pathogenic

microbe is its pathogenicity and that there were such things as inapparent diseases, those which produce no clinical symptoms. This was an essential step towards the understanding of reservoirs of microbes or viruses and the genesis of epidemics. Nicolle was to lay out all these concepts, brilliantly and clearly, in his courses at the Collège de France, collected under the title *Destin des maladies infectieuses*.

Nicolle increasingly became a leading light in the Pasteur Institutes overseas. He was not as remote from the “head office” as Yersin, who travelled little. He welcomed many foreign visitors, including those from Mexico, Poland and the United States, and made efforts to develop cooperation with other Institutes, such as those in Tangiers or Casablanca. He dreamed of uniting the “Mediterranean” Institutes: Algiers, Tunis, Athens, Beirut, Teheran. He became the *de facto* leading “rival” of the Pasteur Institute in Paris. In fact, he was fond of mocking the “immobiles de la métropole,” the stay-at-home Parisians, while he travelled widely on countless missions in Latin America, Mexico, Morocco. He had very modern ideas in the matters of research funding, relations with industry, and about how employees are best managed. “For Nicolle, a Pasteur Institute was first and foremost its people,” wrote Anne-Marie Moulin.

This dynamism and the excellence of the Institute he developed in Tunis led Nicolle to question the quality of the main Institute, which was going through a kind of end-of-reign experience under the authoritarian rod of Dr. Roux, and to consider even that it consisted of “a goodly crowd” of mediocrities. He saw the recruitment and remuneration of young researchers as essential problems and demanded a revolution in the management he was ready to undertake. On the death of Roux and Calmette, however, he was no longer a young man and the hostility of a large number of Pasteurians prevented his succeeding Roux. Roux is even alleged to have expressly stated that he did not want Nicolle as his successor. True or false, this “oral will” was enough to eliminate Nicolle, to his outrage. He died in Tunis in 1936 and is interred at the Institute in Tunis.

Structuring the Institutes into an International Network

The three portraits above give an idea of the quality and diversity of the first Pasteurians, based thousands of miles apart from each other. Together they formed a scientific community that stretched from one side of the world to the other, often working closely with the military medical

department at the local level, and they labored on behalf of the health of the local population and for France's colonies. These men were inspired by Pasteur, eager to apply his new methods, captivated, in some cases, by the lands where they spent many long years: fifty years in Indochina for Yersin, thirty-four in Tunisia for Nicolle, forty-five years in Morocco for Remlinger, over fifty years in Algeria for Edmond Sergent. The Pasteur Institutes, scattered across the five continents, may well have differed in status and level of quality, devoting different degrees of human and financial resources to research, but all had in common the legacy of Pasteur and the desire to improve the lot of the local population.

Jacques Monod infused new energy into this body of institutes, which he brought together in 1971 by creating the Council of Directors of the International Network. They meet annually, one year in Paris, one year abroad, fostering a shared spirit and forging links between the different directors. Their meetings were usually followed by a pilgrimage in the footsteps of Pasteur in Franche-Comté setting the seal on their sense of family. This highly flexible system, more typical of Anglo-Saxon practices rather than of French bureaucracy, allowed each Institute to adapt to its local situation whilst maintaining its links with the "head office."

In the 1980s-1990s, the International Network became much more structured under the management of Maxime Schwartz and Jean-Luc Durosoir, and acquired a charter by which the Institutes were required to abide, guaranteeing scientific quality and ethical integrity. It then went on to adapt itself in response to two major geopolitical changes.

- The first involved South East Asia, with the reopening and rebuilding of the Pasteur Institute of Cambodia, the rehabilitation of the Pasteur Institutes in Vietnam (Ho Chi Minh City and Nha Trang) at the same time as the resumption of relations with the Pasteur Institute of Iran ; in Japan, the creation of a Pasteur Institute of Kyoto seemed an alluring prospect, in view of Pasteur's great liking for its director, Mr. Kishida, but soon proved a mistake, as Mr. Kishida had no wish to abide by any of the constraints imposed by the Pasteur Institute in Paris.



Laboratory at the Ivory Coast Pasteur Institute which is a major actor of public health in West Africa.

- The second comprised Eastern Europe where, immediately after the Romanian revolution of 1989, the management of the Pasteur Institute renewed its contacts with the Cantacuzène Institute in Bucharest,³⁸ which rejoined the Network, along with the Pasteur Institute in St. Petersburg.

In 1999, at the instigation of Bernard Esambert, the HKU-Pasteur Research Center was opened in Hong Kong in cooperation with the university, thanks to the patronage of a prominent resident of Hong Kong, James Kung.

In the early 2000s, the Network was to prove particularly dynamic under the aegis of Philippe Kourilsky. Persuaded of the need to breathe a new lease of life into a structure confined to the former French colonies, he turned his gaze first to Asia, where he felt an important part of the world's future would lie, creating the Pasteur Institute of Korea at the request of the Korean government, and in China the Pasteur Institute of Shanghai, in association with the Chinese Academy of Sciences.

It was during a visit to Paris by Korea's Minister for Research, Yung Bok Chae, that the creation of a Pasteur Institute of Korea was first considered. After an in-depth and worldwide study, the Minister had opted for the Pasteur Institute model and invited Philippe Kourilsky to design and build an Institute and provide a Pasteurian to run it, all financed entirely by the Korean government! Living up to its word, the Korean government undertook to invest \$100 million, followed by another \$300 million, to build a magnificent 15,000 square meter (150,000 sq. ft.) building.

For the Pasteur Institute of Shanghai, the building made available by the Chinese authorities, after heated negotiations, was part of the premises of what was once the Aurora University (unearthed by President Bernard Esambert thanks to a knowledgeable taxi driver!) and Philippe Kourilsky and Michèle Boccoz were moved to see it exactly as the Jesuits had left it sixty years earlier (most notably, with its entomology collection intact, complete with all its labels handwritten in Latin!). The Vice President of the Chinese Academy of Sciences, Chen Zu, a former physician trained in France, played an essential role in smoothing the Pasteur Institute's path into China.

Latin America was the other avenue for development. Since its creation, the Pasteur Institute had been linked to Brazil by the friendship between Pasteur and the Emperor. The two-year stay at the Pasteur Institute by Oswaldo Cruz in the closing years of the 19th century had paved the way, and many Brazilian scientists were frequent visitors to the Institute. Among them, Carlos Chagas Filho (son of the Carlos Chagas who had discovered the eponymous disease) was a familiar figure at the Institute and was very close to Pasteur Vallery-Radot. In later years, researchers such as Luiz Pereira da Silva or Paola Minoprio spent their careers here, joining the ranks of the permanent Pasteurians.

The climate thus lent itself readily to further development of international cooperation. In 1991, an agreement strengthening the academic ties between the Pasteur Institute and the Oswaldo Cruz Foundation was signed by Maxime Schwartz; in October 2004, Philippe Kourilsky and Paulo Buss renewed this bilateral agreement in order to continue this historic partnership.

In 2001, a framework agreement known as Amsud was signed by fifty Mercosur academic institutions to create a cooperative network designed to develop the dissemination of knowledge and exchanges of students and

researchers. The creation of the Pasteur Institute of Montevideo, initiated by Philippe Kourilsky, was an integral part of the Pasteur Institute's opening up to South America. It would be inaugurated in 2006.



Pasteur Institute of Laos inaugurated on January 23, 2012 in Vientiane.

Interest in the International Network continued over the years. In April 2013, the Pasteur Institute of Cambodia celebrated its 60th anniversary. The first cornerstone of a new regional research platform was laid, underscoring the important local role played by the Institute. The platform would be dedicated to transmissible infectious diseases and emerging pathogens in South East Asia. As Françoise Barré-Sinoussi, who regularly worked in Cambodia (and was actually at the Pasteur Institute of Cambodia when she learned she had won the Nobel Prize), wrote in the brochure produced to mark this anniversary:

For over ten years the Pasteur Institute, historic partner in this cooperation,³⁹ has facilitated and contributed, in association with local non-profit organizations, to clinical research combining fundamental and social science in the field of HIV and HIV-*Mycobacterium tuberculosis* co-infections. The result of this network of multi-institutional and multidisciplinary collaboration, built up over time, has resulted in unquestionable improvements in the treatment of Cambodian patients living with HIV.

This is a splendid example of Pasteurian doctrine in the field and of the tradition of these overseas Pasteur Institutes.

Finally, in 2013 as well, a new site for the Pasteur Institute of Shanghai-Chinese Academy of Sciences was inaugurated by President François Hollande. Located on the campus of the Shanghai Institutes of Biological Sciences, the building offers three times more space devoted to studying the mechanisms, the immune responses and strategies for the treatment of infectious diseases.

As soon as he had arrived at the Pasteur Institute, Christian Bréchet demonstrated his interest in the International Network, particularly by launching research groups (four-year groups)—preferably headed by researchers from the Southern hemisphere, such as at the Pasteur Institute of Bangui or the Pasteur Center in Cameroon—and encouraging mobility between Paris and the field. The first stone of the newly created Pasteur Institute of Guinea was laid in November 2016, in the wake of the Ebola epidemic. A project to establish a Pasteur Institute of Sao Paulo in Brazil is on the drawing board. In creating the Center for Global Health, in September 2014, to investigate epidemics and train epidemiological researchers, Christian Bréchet was keen to position the Pasteur Institute in the front ranks of agencies involved in global public health; his wish was realized when in 2016 the World Health Organization (WHO) recognized the International Network as an official partner.



Research Laboratory at the Ho-Chi-Minh-City Pasteur Institute (Viet-Nam).

PART III

THE CONTINUED INFLUENCE OF THE PASTEUR INSTITUTE

“Science has no country, because knowledge belongs to humanity, and is the torch which illuminates the world.”

Louis Pasteur



The cover of the illustrated supplement of the *Petit Journal* of January 14th, 1893: Louis Pasteur's jubilee at the Sorbonne in the presence of President of the Republic Sadi Carnot, on December 27th, 1892.

WORLDWIDE RECOGNITION

“The image of Louis Pasteur has gone beyond all geographic, disciplinary, intellectual and social frontiers and has become universal. Pasteur is more than just a great French scientist. He is considered a benefactor of humankind and is therefore highly regarded by all nations and all peoples.”

Federico Mayor, Director-General of UNESCO, January 17th, 1995, at the opening ceremony of The Year of Louis Pasteur.

Few French institutions have experienced the international fame and reputation enjoyed by the Pasteur Institute. More than anyone, it was Pasteur himself, the symbol of the universality of science, who took his name and that of the Institute far and wide.

Pasteur’s Fame Overseas during his Lifetime

Proof that Pasteur enjoyed uncommon renown overseas during his lifetime came in 1892 when the jubilee organized in his honor at the Sorbonne provided the opportunity for many foreign scientists, including Lister, the renowned British surgeon, to pay homage to the great man. In May 1892, a committee set up in Denmark announced its intention of organizing a tribute to Pasteur to mark his 70th birthday. The idea spread to Norway and then to Sweden, with the King himself subscribing to the appeal. Committees popped up here, there and everywhere, and the Académie des Sciences took on the task of organizing the ceremony, at which four thousand guests, including many overseas delegations, rose to their feet to acclaim Pasteur as he entered the great amphitheatre at the Sorbonne on the arm of President Sadi Carnot.

The incredible number of international honors bestowed upon Pasteur is also a revealing way to track the fame he enjoyed during his lifetime. In addition to the Cross of the Commander of the Imperial Order of the Rose (Brazil, 1873), he was also awarded the Grand Cordon of the Order of Isabella the Catholic (1882), the Order of Saint Sava of Serbia (1886), the Order of Dannebrog (Denmark, 1889), Commander of the Order of Leopold I (Belgium, 1895), the Order of the Savior of Greece, the Order of the Star of Romania, of the Pole Star (Sweden) and the Imperial Order of

the Medjidie (Turkey).⁴⁰ The number of honorary doctorates conferred on Pasteur by overseas universities was beyond count. His wife seemed to take a great pride in the decorations that were heaped upon him. When Pasteur was appointed an associate of the Hungarian Academy of Sciences in May 1881, she wrote: "We are, I believe, now at the 55th diploma of this kind. I can scarcely imagine what awaits us once the studies on rabies are published."

While scientific research was by no means as international then as it is now, Pasteur kept in contact with his foreign colleagues, and his important work in such varied fields as molecular asymmetry, fermentation and so-called "spontaneous" generation had made his name widely known in scientific and industrial circles and caused him to travel widely in Europe. We know his discovery regarding tartrate crystals had "set abating the heart" of Jean-Baptiste Biot, the great chemist of the day; in November 1852 (Pasteur was only 30). Biot wrote to the President of the Académie Française, asking him to facilitate Pasteur's travels in Germany and Italy:

In recent years, a young scientist by the name of Pasteur, in a difficult financial position, has managed, by virtue of his rare talent, his perseverance and his happy successes, to inspire every scientist in Europe to take the liveliest interest in the continuation of his work.

During the heroic period of his major discovery on crystals, Pasteur embarked on a journey that took him to Dresden, Leipzig, Vienna and Prague, to procure supplies of paratartrates. There he discovered for the first time the Germanic world and Germany's flourishing science and industries. It left a lasting impression on him. He later attended international congresses, including the congress on sericulture in Italy in 1876, where he represented France:

This is the first time I have had the honor of attending an international scientific congress, and on foreign soil to boot, and I am overcome by two pervading impressions: the first, that science knows no country, and the second, which would appear to exclude the first but which is, in fact, only a direct consequence thereof, that science is the highest personification of a nation. Science knows no country because knowledge belongs to humanity, and is the torch which illuminates the world. Science is the highest personification of the nation because, of all the peoples, that nation will remain at the forefront which prioritizes through the works of thought and intelligence.

In 1881, Pasteur received a standing ovation at the International Medical Congress held in London, and wrote to his wife:

You would perhaps have been prouder still today. In a vast hall, very fine in its dimensions and architecture, three thousand congress members were gathered together (a record attendance for the time), a bustling anthill of heads on the floor of the hall and in the galleries on the first floor. On the platform, raised very high, sat all the members of distinction, including the Prince of Wales and the Prince Royal of Prussia. Various speeches: the longest and the most remarkable by Sir James Paget, the great English surgeon and an orator of no mean talent. In that speech, only one name was mentioned, my own, and was followed by an ovation. Sitting behind the speaker, and pointed out by him, I was obliged to stand and salute the audience, to the right and to the left, and those beside me, and all this time to the continued applause of the entire assembly, from the Prince of Wales and the Prince of Prussia.

I felt very proud, not for myself – you know how I feel about such triumphs – but for my country, thinking that I was singled out exceptionally, in the midst of this vast sea of foreigners, Germans in particular, who are here in considerable numbers...”

Pasteur’s charming naivety had him believing, on his arrival, that the applause was for the Prince of Wales, and not for him!

As he made his way to the steps up to the platform, [relates René Valléry-Radot, who accompanied him,] applause broke out. Cheers and shouts of hurrah were raised on all sides. Pasteur turned to his two companions, his son and his son-in-law, and said with a worried air, “That must be the Prince of Wales arriving, I should have been here earlier.” “But sir,” said the President of the Congress, Sir James Paget, with a grave yet affectionate smile, “it is you that everyone is cheering.”

In 1884, Pasteur travelled to Denmark for the International Medical Congress held in Copenhagen, at which he represented France, and was invited to stay at the home of J.C. Jacobsen, owner of the Carlsberg brewery; in honor of his guest, the brewer flew the French flag atop his home. Pasteur had rendered invaluable services to the Carlsberg brewery.

Friendship with the Emperor of Brazil

Louis Pasteur would make many friends overseas. The most illustrious of them was certainly the Emperor of Brazil, with whom he kept up a regular

correspondence in which the mutual esteem between the two men clearly shone through.

Don Pedro, a humanist and an enlightened ruler, was a great Francophile, as was the whole of Brazilian society, ever since the arrival of the “French mission” shortly after the creation of the Empire of Brazil at the beginning of the 19th century. The Emperor took an interest in many different fields, and in particular in the science of the day. An attentive and informed observer, he followed Pasteur’s work with interest and, when in Paris, attended his lectures to the Académie des Sciences. When unable to attend, he would read the reports: “I have just read your lecture of the 9th to the Académie des Sciences and beg you to keep me advised at times of your research on infections and the theory of fermentation” (September 11th, 1880, letters of Don Pedro II to Pasteur, Bibliothèque Nationale).

During the 1880s, the Emperor and Pasteur exchanged several letters. Don Pedro was particularly concerned about yellow fever and followed the progress being made in the understanding of microbes. On one occasion, he gently reproached Pasteur: “It has been a long time since I last heard from you. I hope you are not forgetting your research into yellow fever microbes to find the vaccine” (letter from Don Pedro to Pasteur, October 14th, 1882).

On November 30th, 1885, the Emperor wrote: “I impatiently await a completely safe means of administering the rabies vaccine.”

While the Institute was under construction, the Emperor wrote to Pasteur on October 19th, 1887:

Desirous of visiting your Institute, I hope to meet you there on Friday afternoon. I will thus have the opportunity to better discuss with you the work that has always so profoundly interested me.

Your devoted colleague,

Don Pedro d’Alcantara.

In May 1886, the emperor announced to Pasteur that the Brazilian government had bestowed upon him the Order of the Rose “for your services to humanity in stopping the effects of the rabies virus. It is undoubtedly the most remarkable of those invaluable practical applications that science already owes to you, and that gives hope to so many others.”

Don Pedro looked forward eagerly to Pasteur visiting Brazil. As early as 1884, he was writing to him: “Your visit to my country will be an event that will have the greatest influence on scientific progress in Brazil. My feelings towards yourself and towards science are well known to you, and I already rejoice at the idea of welcoming you” (October 14th, 1884).

Pasteur, suffering from fatigue, was unable to embark on the journey, and the Emperor wrote to him of his enormous disappointment:

Your letter of February 23rd caused me deep pain for the all but definitively lost hope of the great benefit to my country I expected from your visit to introduce the yellow fever vaccine. Your studies, so important, on rabies would have been abandoned for only a short time, and the service rendered to humanity in preserving it from yellow fever would have been at least as great.

In June 1881, the Emperor wrote to recommend to him a Dr. Niselli, an associate professor of medicine at the Rio School of Medicine, “a young man of considerable talent. I hope you will be of great help to him” (June 14th, 1881). In 1882, it was the turn of Dr. Ferreira dos Santos, as he was coming to Europe “to develop his knowledge of chemistry and also study microbes.” On May 14th, 1886, Don Pedro wrote once again:

I recommend to you, with full confidence in your warm regard for my country and for myself, Dr. Ferreira dos Santos, professor of chemistry at the Rio School of Medicine, who is responsible for studying your rabies vaccination procedure. I am sure you will do everything in your power so that he can establish the hospital we have decided to create, for Brazil too wishes to contribute to disseminating the benefits of your great discovery.

You can imagine with what joy this will be welcomed by

Your affectionate

Don Pedro d’Alcantara, Petrópolis, May 14th, 1886.⁴¹

This deep-rooted friendship was the origin of scientific ties that continue to this day.

Two other events would add considerably to Pasteur’s international reputation: one in the United States, the other in Russia. The Newark children and the Russian peasants were to become part of the Pasteurian legend in the winter of 1885.

A Star in the United States

In the United States, it was a minor news story that might have gone unnoticed that made Pasteur into a true star: one cold morning of December 1885, a rabid dog roaming the streets of Newark bit six children on their way to school.

The story was reported that afternoon in the press, and the following day a letter from a local physician appeared on the front page of the *Newark Daily Journal* urging that the children be sent to Paris to be treated by Mr. Pasteur against rabies. In the physician's view, Pasteur was the only man who could save them, and funds should be raised for the journey, all the children's families being of modest means. Enough money was raised to organize the journey of four children, aged 5, 7, 10 and 13. James Gordon Bennett Jr. of the *New York Herald* coordinated the appeal and published lists of the donors. Excitement gradually grew as the day approached where the children would be vaccinated and saved.

Pasteur was not yet particularly famous in the United States, except amongst a handful of young physicians who had gone to Europe to train, and the first vaccination of Joseph Meister against rabies had not attracted any particular attention. The adventure of the Newark children, however, was to have a considerable impact. The *New York Sun*, the *New York Herald*, the *New York Times*, the *Saint Louis Globe*, the *Nashville Daily American* and the *Chicago Tribune* reported news of the children, their departure, their treatment at Pasteur's laboratory, publishing a portrait of Pasteur and whipping up real enthusiasm among Americans. Caricaturists and the satirical press were not to be left out: it became the latest fashion, you might say. "Now is the time to get bitten by a rabid dog and take a trip to Paris" (*Puck*, December 23rd, 1885).

The "quatre petits Américains," as the French newspapers referred to them, returned as heroes and were fêted as celebrities: they were even presented to the public in museums or on theatre stages, almost like circus animals, for weeks following their return.

Three years later, Gordon Bennett contributed to the appeal for funds to create the Pasteur Institute.

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SPECIAL NOTICE!
ONE WEEK ONLY, Commencing
Sunday Afternoon, FEB. 14

The Newark Children
Viz: Little Patsy Ryan, Willie Lane & Austin Fitzgerald
PASTEUR'S PATIENTS
FROM PARIS!

Whom we have induced to exhibit, for one week only, at the Enormous Salary of

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THE NEWARK BOYS

One Thousand Dollars

The NEWARK BOYS have returned from Paris in perfect health, after a most successful treatment of that dread disease,

HYDROPHOBIA

By the great Scientist,
PROF. PASTEUR

and they will positively appear in the extensive Curio Hall of this Museum Daily.

A highly instructive and interesting lecture will be given hourly illustrating the methods by inoculation of this wonderful cure.

MAD DOG!



“The Newark children: Pasteur’s patients,” *Broadway & Treyser’s Palace Museum*, February 14th, 1886. The article reports the vaccination against rabies and the cure of four children from Newark in Louis Pasteur’s laboratory in Paris.

The links between Pasteur and the United States were solidly forged. They were never to be broken, and have been supported ever since by the closest of scientific ties. The historian of science Bert Hansen, a professor at Baruch College, recounts this affair in a fascinating book as the first and spectacular incursion of medicine and scientific discovery in the media.

In the years that followed this episode, a large number of Pasteur Institutes came into being in the United States, the first in 1886 in New York, others

in Chicago (1890), Baltimore (1897), Pittsburgh and Saint Louis (1900), Austin (1903), Philadelphia (1904), Atlanta (1908) and Washington DC.

They were essentially rabies treatment dispensaries, set up on the initiative of American physicians who had learned of the success of Pasteur's vaccination. One, the New York Institute, was created by a French physician, Dr. Paul Gibier, who had presented his thesis on the treatment of rabies at the Paris faculty of medicine. His nephew closed it down in 1918, and none of these institutes still exists. It is only recently that science historians have begun to take an interest in the subject.

In 1922, the city of Philadelphia, home of Benjamin Franklin, paid a special tribute to Pasteur on the 100th anniversary of his birth. Two telegrams were sent to the organizers of this memorial, one signed by Roux and Calmette:

Pasteur Institute could not be more touched than by tribute paid by American colleagues to memory of Pasteur Philadelphia. Warmest thanks to all those joining you in this celebration.

The other was from Pasteur Vallery-Radot:

Pasteur family profoundly moved by homage from great American nation: join wholeheartedly with the Philadelphia celebration in the United States, land of enthusiasm and all generous sentiments. Saw last year the great respect for Pasteur: on this anniversary, my thoughts go out to you.

After the two telegrams were read aloud, a prayer of thanks was said to honor the birth of Pasteur. The President of the session claimed that Pasteur's name was to be written not as with ink on parchment, but "in shining, living characters in our hearts." There followed a whole series of speeches, each more laudatory than the last.

Russian Peasants in Paris

After the first vaccination against rabies, Pasteur's aid was called upon from the other side of Europe, far to the East. In the already busy laboratory through which bite victims had been filing for several months, excitement reached its peak when, in January 1886, nineteen Russian peasants from the province of Smolensk in Ukraine suddenly appeared. All had been mauled by a rabid wolf that had been spreading terror through the region. The muzhiks arrived under the leadership of their priest, also bitten, and they did not go unnoticed in and around rue d'Ulm!

Of the nineteen Russians, sixteen would survive thanks to timely inoculation. The photograph of the Russian peasants posing on the steps of the Pasteur laboratory on rue d'Ulm in the Pasteur Museum serves as a reminder of this exotic visit that sparked, among its other consequences, the beginning of relations between the Pasteur Institute and Russia. Tsar Alexander III would subscribe to the appeal to raise funds for the creation of the Institute with a contribution of 40,000 rubles, in recognition of which his bust was placed in a position of honor in the Salle des Actes (Grand Assembly Hall).



The Russians who had been bitten by rabid wolves in Siberia and saved by the rabies vaccination in Paris, outside the Ecole Normale Supérieure in 1886.

In 1885, the Medical Society of Odessa sent a young physician, Nicolas Gamaleia, to Paris to learn about the rabies treatment; on his return to Russia, the young man opened the first rabies treatment center outside Paris. Centers in St. Petersburg, Moscow and Tiflis soon followed. The Prince of Oldenburg visited Paris in June 1886 and asked Pasteur to provide him with a research assistant to apply the rabies prophylaxis method. Adrien Loir and Léon Perdrix were dispatched to St. Petersburg on July 14th, 1886, on what was the first official international mission to

disseminate the “method.” The St. Petersburg rabies treatment center opened its doors and, from July 24th onwards, the first bite victims were treated. This vaccination center would become part of the research institute founded in 1890 by the Prince of Oldenburg, who wanted it to be “similar to the Pasteur Institute in Paris” and named it the Imperial Institute of Experimental Medicine. In 1922, on the 100th anniversary of Pasteur’s birth, it was renamed the Pasteur Bacteriological Institute; in 1937, the former rabies treatment center became part of the St. Petersburg Pasteur Institute.

The Institute and its Policy of Openness

Following the example of its founder, the Pasteur Institute has always opened its doors to overseas researchers, and its private status made this all the easier. From its earliest days, Pasteur’s friendship with the Emperor of Brazil prompted a never-failing flow of exchanges between the Pasteur Institute and Brazilian researchers.

In 1896, Oswaldo Cruz spent two years at the Pasteur Institute. Year after year, a large number of Brazilian trainees could be sighted at the Institute, and cooperation with the Foundation that bears his name has grown stronger in recent years.

Nicolas Gamaleia aside, it is Mechnikov who perhaps best represents the affinity that grew up between the Pasteur Institute and Russia.

Mechnikov, as we have seen, was one of Pasteur’s five heads of department when the Institute opened. Until 1914, Mechnikov’s laboratory was an undeniable magnet and, according to Burnet, one of his close colleagues, “a salon of a new kind, a European scientific caravanserai...” Many Russian scientists, who had left their native country for political reasons, were drawn to the originality and breadth of knowledge of the master; but Ministers to the Tsar, artists, and students also flocked to visit him and formed a kind of eclectic Russian colony that congregated at the *Microbe d’Or*, the family boarding-house adjoining the Pasteur Institute purchased by Beredska. Winning the Nobel Prize in 1908 obviously only added to the prestige of “Father Mech,” as he was affectionately known to his colleagues.

After the 1917 revolution, it was no longer intellectuals in bad odor with the Tsar’s regime who arrived at the Institute, but rather White Russians

such as Pierre Grabar, an officer cadet at the elite Page Corps academy in St. Petersburg. He was arrested and condemned to death for having taken part in the civil war, but managed to escape to Denmark before making his way to France. In 1938, he was appointed a head of laboratory at the Pasteur Institute. And there was Mr. Preobajensky, who shared his name with one of the oldest and most elite regiments of the Russian Imperial Guard, and who came to work in the library.

The 1960s, before and after the Nobel Prize shared by André Lwoff, Jacques Monod and François Jacob, undoubtedly saw a resurgence of the international activity that had prevailed at the Pasteur Institute in its early years. During this time, it was the best and the brightest in British and American science who paid regular visits to the Institute. All the great names in biology, future Nobel laureates or members of the American Academy of Science or of the Royal Academy shared in the first forays into molecular biology and thrilled to the latest Pasteurian discoveries; there were constant exchanges with Francis Crick and James Watson at the Cavendish Laboratory, with the MRC Laboratory of Molecular Biology directed by Sydney Brenner in Cambridge, or with the Salk Institute. Both Sydney Brenner and Roy Vagelos, later to become President of Merck Sharp and Dohme, remained very close to François Jacob. Melvin Cohn, for example, was a faithful follower of Jacques Monod, having arrived in his laboratory in 1948 to complete his postdoctoral studies.

The political climate in the United States at the time drove many an American scientist, intellectual or artist to come to Paris; and the Pasteur Institute at the time was something of an exception in France, where it was very difficult for foreigners to gain admittance to academic structures.

Monod's laboratory became home to a large number of foreign scientists, Americans in particular, making it an international melting pot in which research went on almost day and night, in a constant buzz of discovery. Working conditions still left much to be desired. The laboratories were often sparingly heated and poorly lit, to the extent that Melvin Cohn recalls working in the crypt where Pasteur is interred because there, at least, the lighting was adequate, and he used the tomb as a desk!

Nothing could hamper the enthusiasm of these pioneers of galactosidases and operons, however. Howard Temin, Joshua Lederberg, future Nobel laureates, Paul Marks, Arthur Weissbach and many others remained deeply attached to the Pasteur Institute, and came back to celebrate its

centenary in 1987. Nowadays, scholarship students from the Pasteur Foundation in New York keep these historic links alive; and a Briton, Professor Stewart Cole, has just recently taken up his appointment as President of the Pasteur Institute.

From the Institute's earliest days, citizens of Eastern Europe, Brazil, the United States and elsewhere have numbered amongst the ranks of the Pasteurians. For them, the Pasteur Institute represented a dream, as in Arthur Schnitzler's *Der Weg ins Freie* (The Road into the Open), which depicted the Viennese intelligentsia in the closing years of the 19th century, in which the physician Dr. Berthold Stauber, a young Austrian MP, informs his friends that he is standing down from Parliament and leaving for Paris: "I must work at the Pasteur Institute, I am returning to my first love, bacteriology. It is a cleaner occupation than politics." Closer to the present day, reading a book about Pasteur filled Paul Brey, a young American from Minnesota just ten years of age, with an unconquerable desire to work at the Pasteur Institute.⁴³ Others, like Agnès Ullmann, chose to leave Communist Hungary or, like Luis Pereira da Silva, to quit Brazil in pursuit of better working conditions. They in their turn became enthusiastic Pasteurians, with all the convert's zeal for the Pasteur Institute's universal mission. In reality, they adopted the designation of Pasteurian in place of their nationality. "Science knows no country," Pasteur used to say.

The Pasteur Institute has always cooperated with leading overseas research institutes, such as the Weizmann Institute of Science in Israel, the Riken Institute in Japan or the National Institute of Immunology New Delhi, whose director, Pran Talwar, was very close to the Pasteurians, the Salk Institute, the Cavendish laboratory in Cambridge, etc.

The teaching provided at the Pasteur Institute has also played a major role in its influence. In the latter years of the 19th century and early years of the 20th, it attracted many overseas students eager to learn the new Pasteurian disciplines, which were not yet taught at any university. The courses were given by Roux, Yersin, or by the future Nobel laureates Mechnikov and Laveran. The students came from all over the world: Italy, Spain, Switzerland, Norway, Poland, Russia (the Russians were particularly numerous), Austria-Hungary, the Ottoman Empire, Lebanon, Iran, India, Ceylon, China, New Zealand, the United States, Peru, Colombia, etc. In some classes, foreign students outnumbered the French. In 1899 and 1904, ten or so young women from Russia enrolled. And everyone spoke French.

In this way, the Institute would train generation after generation of physicians and researchers who would spread Pasteurian research and methods around the globe.

The prestige of the Pasteur Institute courses, which confer the coveted title of alumnus of the Pasteur Institute, has lost none of its luster. In 1983, 309 students enrolled, including 63 overseas students from thirty-two different nationalities; in 2011, some 500 students, including 150 overseas students from around fifty nationalities; in 2016, 1,200 students from 68 nationalities. Many researchers from developing countries, particularly in Africa, have found their studies of enormous benefit to their careers in science or as heads of a health organization. Some have even gone on to become directors of Pasteur Institutes such as Mireille Dosso in Ivory Coast, Ha Ba Khiem in Ho Chi Minh City, Fadila Boulahbal in Algiers or Koussay Dellagi in Tunis.

INTERNATIONAL FRIENDS OF THE PASTEUR INSTITUTE

“You delegates from foreign nations who have come from so far to bear witness of your love to France, you bring me the deepest joy that can be felt by a man whose invincible belief is that science and peace will triumph over ignorance and war, that nations will unite not to destroy but to build and that the future will belong to those who will have done the most for suffering of humanity.”

Louis Pasteur, Jubilee at the Sorbonne,
December 27th, 1892.

The influence of the Pasteur Institute can also be measured by the “friends” it has made in several countries, ready and willing to support the research of an institute at some geographic remove from them, and to devote their time to making it better known. These volunteers, in the United States, Canada, Japan or Hong Kong, deserve a special tribute. Working enthusiastically for a cause they consider to be noble, they have given generously of their time.

The Pasteur Foundation in the United States

The first of the overseas foundations, the Pasteur Foundation, was founded in 1985. It served to replace the Rapkine French Scientist Fund, set up just after the Second World War to assist the Institute in re-establishing its laboratories, such as those of André Lwoff, Jacques Monod or François Jacob, and to enable them to purchase from the USA the invaluable books, journals or research equipment so necessary in those difficult times. That system had worked well until 1984 when evidence emerged of serious misconduct by the person supposed to be managing the Rapkine Fund in the United States. Inexplicable behavior such as calling the White House at 1 am in the name of the Pasteur Institute, or failing to file tax declarations, finally came to the attention of the American scientists making up the Fund’s Council. They called upon the Pasteur Institute to take over the reins, and I was sent out to New York to figure out exactly what was going on. With only limited instructions (“Do not commit the Pasteur Institute to anything!”), I discovered in the course of a very uncomfortable meeting

chaired by Paul Marks, the head of the Sloan Kettering Cancer Center, that the Pasteur Institute was inextricably involved in this Rapkine Fund, since it was the Fund's founding member, along with the Paris Faculty of Sciences, but no one knew exactly who did what. Over the years, furthermore, it had actually become its own sole beneficiary.

After several twists and turns, including the mass resignation of the American scientists making up the Council, who were upset by the way the Fund had been managed, the management of the Pasteur Institute decided to retain this tax-exempt structure (thus keeping the magic Internal Revenue Service 501(c)3 status), to re-name it the Pasteur Foundation and to raise money from the public in the United States. Maxime Schwartz, deputy director of the Institute at the time, became its president. In view of the importance of the links between the two scientific communities and America's tradition of philanthropy, there was a certain logic to this decision and a great hope of developing a Pasteurian presence in the United States, in New York at least, to begin with. Friendly and effective support from the French diplomatic services, the Consulate General in New York and the Embassy in Washington, were crucial in winning a "social" status (so important in New York) for the Pasteur Foundation: André Gadaud, François Bujon de l'Estang, Benoit d'Aboville, Richard Duqué, Jean-David Levitte and François Delattre never failed, through their patronage, their attendance at Pasteur Foundation galas and their support, to demonstrate their interest in the efforts of the Pasteur Institute.

François Jacob was an indefatigable supporter of the launch of the Pasteur Foundation, "patrolling" Fifth Avenue, as he put it, in search of wealthy Americans who could be persuaded to help the Pasteur Institute ("Charlie Chaplin amongst the billionaires," as he used to say). We were to discover with some bemusement the fundraising techniques practiced in the United States and the galas where the trick is to sell tables for 10,000, 20,000 or 50,000 dollars, learning at the same time the generosity of Francophile Americans.

In the end, it was an honorary committee (the American Advisory Board) chaired with brio by Elizabeth Fondaras, and subsequently by Anne Cox Chambers, two incredible Francophile American women, assisted by a handful of French residents of New York, such as Agnès Hibon or Luc de Clapiers, who enabled the Foundation to gain a foothold on the New York charity scene. When every evening has a series of galas in aid of cancer, AIDS, the blind, museums, gardens, multiple sclerosis and a thousand

other good causes, it is difficult for a French institution to make its voice heard. The Pasteur Foundation achieved on a number of occasions the ultimate accolade of appearing in the Sunday edition of the *New York Times* on the page featuring the most important charities of the week.



Elizabeth Fondaras, President of the Pasteur Foundation in New York, from 1987 to 2006. Joe Vericker/Photobureau.

For its launch in New York, the Pasteur Institute was fortunate enough to be able to profit from an exhibition of the Duchess of Windsor's jewels. The Institute was her legatee by universal title, which made it seem logical to organize a select preview of the exhibition. Five hundred people filled the headquarters of Sotheby's on York Avenue for the occasion. No more brilliant a start for the Foundation could have been imagined. This was followed by a number of other events, including the opening of the social

season at Bloomingdale's⁴⁴ with a dinner attended by 1,200 guests, sponsored by Petrossian, on the occasion of the bicentenary of the French Revolution in October 1989; a gala evening headlined "Vive la France" aboard the French navy training ship *Jeanne-d'Arc*, making a stopover in New York; and premieres of French films, which provided opportunity to bring over famous actors such as Gérard and Guillaume Depardieu for *Tous les matins du monde*, or Isabelle Huppert and Charles Berling for *Les Palmes de M. Schutz*.

Later, as the years passed, the Pasteur Foundation Award was presented to eminent figures such as President Clinton, Nelson Mandela, Richard Holbrooke, Muhammad Yunus, and Franck Riboud, each for major contributions in one form or another to the improvement of public health. The gala in honor of President Clinton proved particularly successful, and an opportunity for Philippe Kourilsky, then President of the Pasteur Institute, to present the American president with an 1886 lithograph published in the satirical review *Judge*, showing President Cleveland, his face superimposed with the features of Louis Pasteur, vaccinating the USA against corruption.

Elizabeth Fondaras, Commandeur de la Legion d'Honneur, had become a Pasteurian. After being introduced to President François Mitterrand at the centenary of the Pasteur Institute in October 1987, she had come to realize just how prestigious this institution really was, and that it served a cause that was not uniquely French but truly universal.

Profoundly generous and of an extremely open mind, she had for years funded a scholarship for a young French student to spend a year studying at a top American boarding school, St. Paul's School in New Hampshire. She became an enthusiastic supporter of the Pasteur Institute, used her address book to its advantage and rallied the whole of New York society to its cause with inexhaustible energy, saying on many occasions that the Pasteur Institute had done far more for her than she had for it. Obviously, she was no specialist in molecular or cellular biology; clearly she was surprised, being so elegant herself, by the relaxed dress code of the young researchers in their jeans and sneakers, but she was a wonderful ambassador for the Pasteur Institute, and she would never forget the phone call from François Jacob, at 7 in the morning, telling her that she had been awarded Chevalier de la Legion d'Honneur: "Liz, I do hope I woke you up." To the very end, (Liz Fondaras died at the age of 96 in the summer of 2012), her loyalty and generosity were magnificent.



Philippe Kourilsky welcoming President Clinton to the Pasteur Foundation gala, New York, April 19th, 2005. Joe Vericker/Photobureau.

Another member of the Council, and another kind of person, was Judith Sulzberger: granddaughter of the founder of the *New York Times*, herself a physician and researcher, she was well placed to understand and appreciate the Pasteur Institute's research. Genes, DNA and the double helix held no mysteries for her and, like so many researchers, she shared in the special excitement that comes with a discovery and the joyous look of the eternal student. Most generous and yet very discreet, she took a particular interest in the Pasteur Foundation's postdoctoral program, well aware that it was the Foundation's *raison d'être*. A number of young Americans enjoyed the privilege of becoming Judith P. Sulzberger Fellows.

Another leading light of the Pasteur Foundation, who joined at the request of Elizabeth Fondaras, was Anne Cox Chambers, a prominent socialite from Atlanta. Her father, who served several terms as Governor of Ohio, was a Vice-Presidential candidate on the same ticket as Franklin D. Roosevelt, and she herself was an ardent supporter of Democrat Presidents Carter and Obama. As keenly interested in art as in science and a patron of the Atlanta High Museum, Anne Cox Chambers succeeded Elizabeth Fondaras as President of the Pasteur Foundation and had recently demonstrated her attachment to Pasteur by funding the restoration of the small dining room in the Pasteur Museum. Accustomed to spending part

of the year in France at her superb property in Provence, this discreet and sensitive woman was appointed *Commandeur de la Legion d'Honneur* by the French Minister of Culture, Frédéric Mitterrand, in December 2010.

Honor is also due to the constant and generous aid provided by the Florence Gould Foundation and by John and Mary Young, who have given the Foundation their aid from the start. The running costs of the first years of the Pasteur Foundation offices on Madison Avenue were paid by the Gould Foundation, before the foundation went on to finance research equipment and programs for the laboratories, the construction of a high-containment (P3+) laboratory and, for seventeen years now, a substantial program of postdoctoral scholarships which enable young American researchers to spend three years at the Pasteur Institute.

Finally, the history of the Pasteur Foundation would not be complete without mentioning of the role of its Executive Director, Caitlin Hawke; American, bilingual and a lover of French culture, Pasteurian to the core, she was a paragon of extraordinary efficiency over a period of twenty years.



Caitlin Hawke, then director of development of the Pasteur Foundation in New-York is awarded in April 2012 the Legion of Honor by Marie-Hélène Marchand, in presence of François Delattre, French Ambassador to the United States and Françoise Barré-Sinoussi, 2008 Nobel Prize in medicine.

Elsewhere around the World

In Japan, things were somewhat different. There were, of course, scientific relations between the Pasteur Institute and Japanese researchers who came to work at the Institute, including Professor Mikoshiba, the great neurobiologist, who spent two years working with Jean-Pierre Changeux. But the Pasteurians were apprehensive about spending long periods in Japan and, indeed, Japan had no tradition of patronage such as existed in the United States. It seemed rather strange that the Pasteur Institute should have no presence in this country of great scientific and technological innovation, hence Philippe Kourilsky's hopes that a group of friends might develop in Japan. The Association Pasteur Japon (APJ) was created in 2002 with the assistance of Mr. Isao Soejima and Mr. Masatoshi Watanabe, who devoted many hours of their time (on a volunteer basis, naturally) to the project. Both were fluent French speakers, having both lived in Paris, Mr. Soejima as the director of a major Japanese trading house and Mr. Watanabe as director of the Bank of Tokyo. Great Francophiles, they created a privileged link between the Pasteur Institute and the seemingly mysterious world of Japanese culture, and it is thanks to them that the Emperor's brother accepted the title of Honorary President of the Association Pasteur Japon, which in 2017 became the Pasteur Japan Foundation.



Masatoshi Watanabe and Isao Soejima (†), co-founders of The Pasteur Japan Foundation.

Several symposia on Pasteur's contributions to industry and biotechnology were organized in conjunction with leading Japanese newspapers, easily attracting audiences of around a thousand. Dinners at the Tour d'Argent restaurant in Tokyo and the printing of a special Hermès scarf sold in aid of the APJ helped to make Pasteur's name more widely known, and attracted Japanese researchers to the Institute.

Elsewhere Bernard Esambert was responsible for organizing the Institute's collaboration with the University of Hong Kong to found a joint research laboratory, the HKU-Pasteur Research Center, led initially by Antoine Danchin and then by Ralf Altmeyer. An Association of Friends of the Pasteur Institute of Hong Kong came into being in 2002 with the aim of finding funding, as in the United States or Japan, for scholarships for researchers, in this case Chinese, to work at the Pasteur Institute. It was the notable figure of James Kung who was central to Pasteurian initiatives in Hong Kong: a descendant of Confucius, wise as a mandarin, he was a man of great refinement, a true Francophile and a lover of fine wines. The receptions he hosted at the Hong Kong Club were most elegant and refined. He financed the creation of the laboratory, to which he attached particular importance, and was keen for it to be extended, a project to which he also contributed financially. In recognition of his services to France, including funding the restoration of the Guimet Museum, he was appointed Commandeur de la Legion d'Honneur.

The Hong Kong Chamber of Commerce gala, the social highlight of "French May," was twice held in aid of the Friends of the Pasteur Institute of Hong Kong, in 2002 and in 2006, and Hermès produced a special scarf sold across the whole of South East Asia and far as Singapore. It was also under the auspices of the Friends of the Pasteur Institute Hong Kong Limited that the Yersin exhibition was held in 2008, attracting 30,000 visitors. From that day forth, Yersin's name was no longer unknown: before that, a plaque commemorating the plague epidemic of 1894 had not even mentioned his name.

In addition, the eminent philanthropist Li Ka-Shing, a discreet figure but in fact the wealthiest man in Asia, donated 5 million Hong Kong dollars in 2005 the Pasteur Institute Shanghai, hoping to develop contacts with the University of Shantou in the city of his birth.

In Canada, in Montreal to be precise, it was a well-known local law firm that rallied to the cause of Pasteur. Georges Robic, who took on the task of

creating the Canadian Louis Pasteur Foundation, followed by Jacques Léger, and then by François Painchaud, with Michel Bergeron from Laval University in Quebec, all played a major role. Les Grands Ballets Canadiens, and leading artistes such as Hélène Mercier and Yannick Nézet-Séguin, demonstrated their enthusiasm for the cause by taking part in splendid galas in aid of the Foundation, which was thus able to endow scholarships for Canadian researchers to study at the Institute.

In Switzerland, in Geneva, we enjoyed very friendly relations with Dominique Dunant, great-nephew of Henry Dunant, the founder of the Red Cross, who continues to uphold the family history of philanthropy, notably through the Conny-Maeva Charitable Foundation. He was most generous to the Pasteur Institute on the occasion of the Brazilian evening held in the Orangery of the Château de Versailles in September 2002, and ever since then has regularly funded research programs. In 2011, Alice Dautry set up a new foundation in Switzerland, registered in Geneva.

Even these few, brief profiles of overseas friends of the Pasteur Institute demonstrate the eminence and the generosity of those who have served the interests of the Pasteur Institute overseas. The Institute owes them a great debt of gratitude.



The historic building in 1997. It houses the Assembly Hall (formerly the library), the museum, and several laboratories.

COMMEMORATION AND CELEBRATION

“It is salutary to remind cities that they only live on through the ages by the genius or the valor of some of their children.”

Louis Pasteur

The commemorations that have always punctuated the life of the Institute are, in their own way, further signs of its wide-ranging influence.

The Pasteur Institute is much given to commemorations. This began very soon after Pasteur's death (actually, even during his lifetime, if you include the Jubilee at the Sorbonne!). The anniversaries of the birth and death of Pasteur and of the creation of the Institute have spanned the 20th century. The Pasteur Museum also scrupulously and regularly listed the anniversaries (25th, 50th and 100th) of the births and deaths of Pasteurians to arrive at an impressive total figure. In 1971, a ceremony was even held to celebrate the 50th anniversary of André Lwoff joining the Pasteur Institute. Not to mention the anniversaries of major scientific discoveries: in 2013, for example, the Institute celebrated the 50th anniversary of allosteric interactions, the joy of which would, naturally, be shared by only a handful of specialists!

When I arrived at Pasteur in 1983, they were “celebrating” the 50th anniversary of the death of Calmette and Roux, who died within eight days of one another just as Calmette was about to succeed Roux.

1985 brought the centenary of the first vaccination against rabies. The success of this vaccination has reverberated around the world, and many countries would celebrate it in 1985. Some, like Romania and Mexico, took the initiative of launching their own commemorations. In Paris, a seminar was held at the Sorbonne, chaired by Prime Minister Laurent Fabius, and a wonderful exhibition in comic strips created by the Musée en Herbe made the story of rabies and the complex principle of vaccination accessible to children and adults alike.

It was the events in 1987 and 1995, however, that still live on in the memories of many Pasteurians.



October 5th, 1987, opening ceremony of the centenary of the Pasteur Institute, in the presence of President François Mitterrand.

1987, the Centenary of the Pasteur Institute

To mark the centenary of the Pasteur Institute in 1987, the Board of Directors chaired by François Jacob was keen to stage a prestigious event that would remind everyone of the role played by the Pasteur Institute since its inception and exactly how the institution was prepared for the century ahead. The last thing they wanted was to re-create the atmosphere of the appeal for funds that had clouded the creation of the Pasteur Institute, but hoped rather that the quality and interest of the proposed events would inspire the public to new heights of generosity.

The event therefore took four years of preparation, conducted with enthusiasm by the troops of the Secretariat General and the scientists. The work lay somewhere between a commando operation and teamwork. The aim was to define target audiences as closely as possible – political and administrative circles, researchers, schools, the general public – with a certain number of operations corresponding to each:

an official session for the French President and government, scientific symposia for the researchers, an exhibition for the general public, a newsletter for Institute staff, and so on. Once the matrix was drawn up, a group took charge of each operation, with the Secretary General responsible for overall coordination. The great success of the entire operation was due in very large part to the commitment and support of François Jacob, with whom I was fortunate enough to prepare the entire event. His tall and elegant person, his natural reserve did as much as his title of *Compagnon de la Libération*, his status as a disabled veteran and, of course, his Nobel Prize, to impress his audience. He opened all doors, be it to ministers of government or CEOs of leading firms, which proved invaluable in terms of publicizing and financing the event.

The logo of the 1987 centenary centered around an illustration of the historic building of the Pasteur Institute, since this was all about celebrating the history of a “house,” and placed the celebrations under the sign of the century yet to come, in accordance with François Jacob’s wishes. A trademark was registered, comprising an image of the historic building, the name of the Pasteur Institute and the slogan: “1887-1987-2087, un nouveau siècle” (a new century). This elegant logo adorned all the centenary documents, from the letterhead to the invitations to the gala at the Opéra to the scientific symposium and to the ceremonies presided over by François Mitterrand or Jacques Chirac.

Recognized as a part of French national heritage, and acknowledged as such on the Ministry of Culture’s list of annual celebrations, the centenary of the Institute was an event both scientific and cultural. It gave us the chance to remind the world that it was in these very laboratories that so much of the work was done that would now affect the lives of future generations.

Before the inauguration of the centenary celebrations, François Jacob called on the press to show as much interest in scientific development as they did in cultural events. In contrast to the image that some still had of the Pasteur Institute, this was no antiquated museum piece, and the Pasteurian was no longer a dignified old man with a white beard and a smoking cap! It was also vital to present a more comprehensive picture of the Institute, of its highly diversified activities, split between research and application, at the heart of a powerful network of Pasteur Institutes overseas stretching across the five continents and, of course, to pass on the ideals of Pasteur to new generations.

Above all else, special attention was paid to the Pasteur Institute staff. They received a regular centenary newsletter report on the progress of the preparations, supplemented by articles about great Pasteurians in history. It was seen as essential to nourish “in-house” the knowledge of the past and to unite the energies of all behind a project that looked to the future as much as to the past. In fact, the very first reception held was for the staff, on the eve of the official inauguration.

A scientific symposium entitled “Molecular biology and infectious diseases,” organized by Maxime Schwartz, then deputy director, was inaugurated by President François Mitterrand, welcomed by the troops of the Garde Républicaine and accompanied by eight serving government ministers – not something you see every day⁴⁵ – before an audience consisting of the entire scientific and administrative establishment of the country and of almost a dozen US Nobel laureates and eminent scientists, all former Pasteurians.

In his address welcoming the French President, François Jacob said:

One hundred years ago, in the exhilaration of a victory over one of the most dramatic and most elusive diseases, rabies, the whole world came together to build what can only be seen as the first institution entirely devoted to life sciences and human health.

The President replied as follows:

It is enough simply to refer to the great names that have succeeded one another as director, as president, to realize that here we stand before the armorial bearings of all that a century of medical science and French biological and genetic science has enabled us to know... Here there is learning, here there is research, here there is treatment, here there is redistribution of knowledge, here there are eyes wide open to the needs of the coming century.

Events aimed at the general public pursued the objectives stated above. The release of a splendid film, *Pasteur, le siècle*,⁴⁶ directed by Frédéric Rossif, the restoration of the Pasteur Metro station, with the addition of a permanent exhibition on the Institute,⁴⁷ the organization of a day – October 8th – on which a lesson on Pasteur and on the Institute’s contributions to improving public health was taught in every secondary school in France, also sent signals to many different audiences.

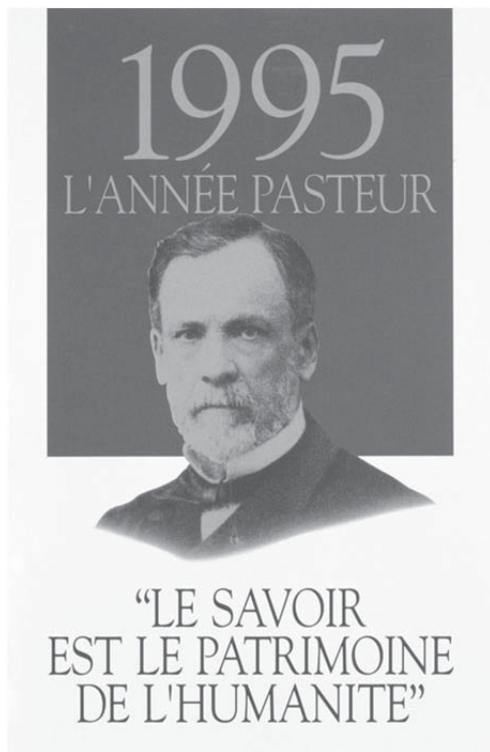
On Saturday, October 3rd, 1987, the hall of the Duclaux building was transformed into a post office to host the “first day cover” event for the stamp issued to mark the centenary, based on the logo described above.⁴⁸

On the cultural front, a gala at the Opéra de Paris, under the auspices of Prime Minister Jacques Chirac, attracted all the leading figures of the Parisian political, scientific and art scenes. We drafted the program for the evening with Pierre Boulez (a Professor at the Collège de France, and hence a colleague of François Jacob), before submitting it for the approval of Rostropovich in the course of a very select dinner at the home of Yvette and Etienne Vatelot, who were kind enough to introduce us to the maestro. Pierre Boulez conducted the Paris Opera’s Orchestra in a lavish concert devoted to the music of Pasteur’s day (Debussy, Dvorak, Mahler), hailed by *Le Figaro* as “A moment of perfection and shared emotion” crafted by the complementary talents of soloist and conductor. The best seats were set aside for Paris high society and, as always at this kind of event, the most expensive seats were the first to sell out – at the time, Line Renaud warned me: “At under 3,000 francs, no one is interested!” The box seats were reserved for the Pasteur Institute’s guests, overseas scientists, Nobel laureates. The actual staff of the Pasteur Institute were able to enjoy this grand evening for a much lower price.

Ceremonies and commemorations were not confined to Paris, but were held throughout France and also abroad. A traveling exhibition went to all the Pasteur Institutes overseas and, in the United States, the Pasteur Foundation played its part in organizing a symposium at the National Institutes of Health in Bethesda. Finally, a ceremony was held under the great dome of the Institut de France.

Exceptional celebrations call for exceptional funding. Fundraising for the centenary was kept strictly separate from normal fundraising, so as not to encroach on the sums habitually destined for research. The necessary funds were raised thanks to significant assistance from both governments and the world of business, and thanks to the vital moral and financial support of Antoine Riboud, CEO of BSN. Maurice de Kervénoaël, then director general of BSN, provided me not only with loyal and unflinching friendship but also with energetic and effective assistance in preparing this operation. A lunch was arranged at BSN, in Antoine Riboud’s private dining room, for several CEOs of leading firms, among them François Dalle and Patrick Ricard, which proved crucial to the funding of the project. At the beginning of the meal, Antoine Riboud offered to

contribute 500,000 francs; his guests could scarcely do less, and the goal was reached by the time dessert came around! The whole operation resulted in a net profit for the Pasteur Institute. More gifts were to follow.



“1995, l’année Pasteur,” poster and logo for The Year of Louis Pasteur, in commemoration of the centenary of Pasteur’s death.

1995, The Year of Louis Pasteur

The entire world was invited to pay tribute to Pasteur in 1995, the year of the centenary of his death. Under the auspices of UNESCO, The Year of Louis Pasteur was held, under the direction of Maxime Schwartz, from January 17th to September 28th, 1995, the anniversary of Pasteur’s death. It became an international event, and the anniversary was announced in a joint press release by the Pasteur Institute and UNESCO, pointing out that Pasteur’s discoveries were synonymous with immense progress for

humanity in the fields of health, agriculture and industry, and how his rigorous approach and constant concern for the practical applications of science had inspired researchers for over a century. As with the Jubilee of 1892, some countries and professional associations embarked on initiatives of their own.

As in 1987, The Year of Louis Pasteur set out above all to offer a contemporary lesson to remind scientists of the methods and strict rigor that had enabled Pasteur to carry out his work, and to remind all of us of our debt to Pasteur in terms of health and the economy, and hence in our daily lives.

The inaugural session was held at UNESCO headquarters on January 17th, before an audience of twelve hundred people representing some twenty-four countries. It began with messages from the Heads of State read out by their respective ambassadors, including Pamela Harriman for President Clinton, the Ambassador of Israel for Ezer Weizman, the Ambassador of Vietnam for Le Duc Anh and the Ambassador of Brazil for President Cardoso; President Ben Ali of Tunisia delivered his message by video. President Mitterrand of France, unable to attend due to illness, sent a message that was read out by Bernard Esambert, Chairman of the Board of Directors of the Pasteur Institute. Some of the best of the speeches deserve mention.

UNESCO Director-General Federico Mayor, in his welcoming address to participants, pointed out that the decision to involve the organization in this event had been taken unanimously by all member States, a sign that the figure of Pasteur transcends frontiers, and spoke of “the rare combination of discipline and vision, of science and patience, and of passion and compassion that he personified.”

Bernard Esambert chose as the prologue to his own speech this quote from Pasteur: “It is salutary to remind cities that forget the fact that they live on through the ages only by the genius or the valor of some of their children.” He went on to pay tribute to the researchers who, “in their laboratories, far from media and spotlights, track down the viruses and microbes that sow suffering and misfortune across the planet. It is through their work, both austere yet thrilling, that men are treated and cured.”

Maxime Schwartz, for his part, summed up with great clarity the scope of Pasteur’s work:

The truth is that Pasteur's work in its entirety laid the foundations on which it proved possible to build the microbial theory of disease. He showed how to cultivate bacteria and later, in the case of rabies, he was to establish the early stages of culturing viruses in animal tissue. Furthermore, he explored the mechanisms by which pathogenic microbes caused profound disruptions in the physiology of the infected organism. He showed how pathogenic agents could spread through animal and human communities, laying the first foundations of infectious disease epidemiology, and laying down the fundamental rules of hygiene. Lastly, he established the core principles of vaccination and founded immunology.

Then a young American, Paul Brey, and Mr. Ha Ba Khiem, Director of the Institut Pasteur of Ho Chi Minh City, each expressed in their own words the influence of Pasteur on their respective careers: one, a schoolboy from Minnesota in the United States who, from the age of 10, dreamed of coming to Paris to work at the Pasteur Institute,⁴⁹ and the other who, despite political tribulations, now headed the first Pasteur Institute to have been founded outside France. What better way to demonstrate what the figure of Louis Pasteur represents for scientists the world over?

Numerous events took place throughout the year, held both for the scientific community and for the general public.

International symposia represented the main aspects of Pasteur's work. They were held either at the Pasteur Institutes themselves, or at institutions of a similar nature. Some were founded on the model of the Pasteur Institute, such as Rockefeller University in New York or the Oswaldo Cruz Institute in Rio de Janeiro. On every continent, from Rio to New York by way of Dakar, Hanoi or Tahiti, these symposia brought together researchers working on the modern-day continuation of Pasteur's work: the origins of life and molecular evolution, the etiology and pathogenesis of infectious diseases, microbes, environment and biotechnology, recent developments in molecular biology, fundamental aspects of vaccinology. One symposium held at Marnes la-Coquette was devoted to the contribution made by Pasteur's research and discoveries to industry: in the beer, wine and dairy industries and, more widely, to agriculture and livestock farming, to industries using enzymes, to pharmaceuticals, and to the environment.

Events targeting at the general public were many and diverse: the issue of a stamp in Pasteur's honor, a major exhibition⁵⁰ (800 square meters) organized by Annick Perrot, curator of the Pasteur Museum, entitled "Une vie pour la vie" (A life for life), illustrated Pasteur's work and its

consequences for contemporary science; another, less technical exhibit entitled “Pasteur, l’homme” (Pasteur the man), which focused on his family life and his relations with leading figures of the day, and which traveled the world. A solemn session was held under the dome of the Institut de France; a film, *Pasteur, regards d’aujourd’hui* (Pasteur as seen today), was released; and a 2-franc coin bearing the image of Pasteur was issued by the Ministry of Finance.

The anniversary was also an opportunity to restore significant places of remembrance: the house of Pasteur’s birth in Dole; his home in Arbois, restored by its owner the Académie des Sciences; and his office at the Ecole Normale Supérieure, where he spent most of his career; first as a student and then, later, as an administrator and director of scientific studies.⁵¹

Finally, on September 28th, the closing ceremony of The Year of Louis Pasteur was held at the Pasteur Institute, in the presence of President Jacques Chirac. The Director-General of UNESCO and the President of the Pasteur Institute awarded the Pasteur-UNESCO medal to a Thai professor, Dr. Natth Bhamarapavati.⁵² Nor was the world of education forgotten: with the help of the French Association of Biology and Geology teachers, articles based upon the themes of each symposium were written for high school students.

Finally, a session at the Ecole Normale and another under the dome of the Institut de France rounded off the commemoration in fine style.

As these events were taking place, The Pasteur Year was also happening overseas. It was inaugurated with a bang in Philadelphia, on January 30th, in memory of that city’s commemoration in 1922. In addition to the Ambassador of France to the United States, Jacques Andréani, and Maxime Schwartz, President of the Pasteur Institute, Professor Hilary Koprowski, former director of the Wistar Institute, Roy Vagelos, former president of Merck Sharp and Dohme and a former Pasteurian, and Harold Varmus, director of the National Institutes of Health, paid tribute to the memory of Pasteur before a large assembly, including one particularly attentive family : the descendants of William Lane, one of the young Americans saved by Pasteur in December 1885.

Close to fifty American cities then played host to a traveling exhibition, accompanied by lectures and screenings of the film *Pasteur, regards*

d'aujourd'hui, thanks to French consulates, Alliances Françaises, institutes, and universities. The Pasteur Foundation in New York played an outstanding role in this initiative.

Another headline event of The Pasteur Year was the re-opening of the Institut Pasteur in Cambodia. Destroyed in the late 1970s as a result of the war, it was rebuilt by the Pasteur Institute with the aid of the Ministry of Foreign Affairs. Its formal re-opening during Pasteur Year was the perfect symbol of the Institute's interest in the public health problems of the developing countries.

All in all, the name of Pasteur was celebrated in a hundred and twenty countries, in particular in Italy (some 30 events), in the United States and in Mexico, and not just in Rome, New York or Mexico City, but also in tiny villages far from a capital.

Towards Communication with the General Public

For many long years, the Pasteur Institute seemed to engage in communication by accident rather than deliberately, and was hardly the worse for it. It must be said that Pasteur himself had the gift of communication. Convening journalists to attend his experiment in Pouilly-le-Fort and his decision to focus on rabies, an attention-grabbing disease if ever there were one, are just two examples of that talent.

The public subscriptions of 1887 and 1894 guaranteed the Institute a reputation that was cemented by the great discoveries of Pasteur's successors. Later, the open-door days organized with such skill by Joël de Rosnay in the 1970s did much to increase the Institute's public profile, as did the discovery of the AIDS virus in 1983 (which, given the scale of the epidemic, made a huge impact around the world), the Duchess of Windsor's bequest and the international celebration of two centenaries. However, the Institute's preference had usually been for sober, more restrained communication.

On repeated occasions, the Board of Directors, especially under the Chairmanship of Marcel Boiteux (a former and particularly eminent President of the National Electricity Company of France), who was adamant on this point, reiterated its wishes for the Institute not lose its soul by excessive publicizing of the fund-raising system.

But the ever-closer link between public relations and fundraising has recently led the Institute into communicating more directly with the general public, in the hope of significantly increasing the number of its donors. A portion of its budget does depend on donations.

As a result, the Pasteurdon⁵³ campaign (=Giving to Pasteur), a wholly new departure for the Institute, was launched in May 2007, with the support of eight national radio stations, to encourage the general public to contribute to the funding of research teams, an operation which certainly brought the Institute to the attention of a much wider public. The campaign has been repeated every year since then and, overall, the number of donors has increased substantially. The Institute now has its own “Ambassador” in the person of Erik Orsenna, a writer and member of the Académie Française, where he occupies the seat once held by Pasteur, a fact that prompted him to write Pasteur’s biography and use his position to support the Institute.

Clearly, the tradition of commemoration and celebrations remains alive! The aim of these events is to keep the Pasteur Institute firmly in the public eye and mind and encourage people to support it. We will see in the following chapter how bequests, in particular, foster a very special link between the general public and the Pasteur Institute.

STORIES ABOUT OUR BEQUESTS

“Take an interest, I beseech you, in these sacred abodes that we so expressively term laboratories. Insist that there be more of them, and that they be properly adorned: they are the temples of the future and of our wellbeing.”

Louis Pasteur

How should one convey an image of the Pasteur Institute without mentioning the gifts and bequests, all of which testify to the continued impact of the Pasteur Institute? Aside from the tale of its discoveries and that of its scientists, famous and less known, there is another angle from which to tell the tale of the Pasteur Institute, and that is by way of the donors who made the whole story possible. Many of them are unknown to the general public, and they surely deserve to be mentioned. Moreover, interacting with them was a part of my activities that I found particularly inspiring.

To look at the gifts, and the bequests in particular, is to realize how deeply the image of the Pasteur Institute had an impact on certain generations and led individuals to donate all or part of their possessions to enable our Pasteurian work to endure. The Pasteur Institute is, in fact, immensely fortunate in that it inspires trust, and trust is the key to the motivation that prompts the donor to act. The examples that follow will illustrate the great diversity of donors and how deep the link is between all kinds of people and this institution.

It is an unusual journey through time and space (for the Pasteur Institute has received many overseas bequests) that will take us from the cemetery of Montmartre to the Vallée-aux-Loups, by way of the most remote rural backwaters of France, via the Hôtel Beau-Rivage in Geneva, the green hills of Innsbruck and the terraces of Rome. Perhaps even more than doctors, lawyers are fine specialists in the human soul, and the history of inheritances, combining as it does money, emotion, family rivalries, well-kept secrets and other dirty laundry, would make an amazing novel.

Created thanks to public subscription, the Pasteur Institute continues to function thanks to the generosity of the public. A few illustrative figures:

in 1980, donations and bequests (and revenue from assets, mainly from interest on bequests) amounted to 52 million francs, approximately 25% of the annual budget. Currently, philanthropic donations are around 23.6% of the budget (75 million euros), while the budget itself has risen from 204 million francs in 1980 to 210 million euros in 2005 and 319.5 million euros in 2016.

The Pasteur Institute has received some 4,986 bequests since its creation, of which 2,261 were made between 1981 and 2000, a particularly fruitful period, and 1941 between 2001 and 2017.

The First Bequests

You would probably be amazed to be told that the biggest bequest ever received by the Pasteur Institute was the Osiris bequest.

“Osiris,” you say. What kind of strange name is that? In reality, Osiris was one Daniel Iffla. Born in Bordeaux in 1824 to a Jewish family long established in the city, he died in 1907 after making the Pasteur Institute his legatee by universal title. He had come to Paris as a fairly young man and, from modest beginnings, proved himself to be a financier of great talent. He had a finger in every real estate deal under the Second Empire and amassed an immense fortune that enabled him to become a true patron. As such, he purchased the Château de Malmaison and, after fully restoring it, gifted it to the State in 1904. He financed public fountains in Bordeaux, a crèche and a serum therapy institute in Nancy, an operating block at the Pitié-Salpêtrière Hospital, the statue of Alfred de Musset first placed outside the Comédie-Française theater in Paris (and now in the parc Monceau) and numerous synagogues. Osiris began by endowing scholarships for students of Dr. Roux before naming the Pasteur Institute in his will: “I place my universal legacy and its execution under the memory of the great Pasteur, one of the purest glories of my country.”⁵⁴ No better explanation is needed for a bequest that furnished the Institute, at an important moment in its history, with the resources to secure its future, by enabling it to purchase more plots of land on rue Dutot, rue des Volontaires and rue de Vaugirard. This allowed for the further expansions, such as the construction of the Radium Institute, and provided a solid asset base, the income from which covered operating expenses until 1939. Osiris is buried in Montmartre cemetery, at the feet of a reproduction of Michelangelo’s Moses, as he had requested. The tomb, completely

restored by the Pasteur Institute in 1993, is one of the most prominent monuments in the cemetery.

Between 1887 and 1914, the Institute received forty-two bequests totaling 43 million gold francs, including that of Osiris and a bequest of one million gold francs from the Comtesse de Maubreuil, Marquise d'Orvault. While still a young woman, she had married the Comte de Maubreuil, aged 82 at the time. He died two years later.

In 1937, the legacy left by Mademoiselle Courbe played its part in the Institute's history: in addition to securities, a mansion on the avenue Hoche in Paris and buildings on the place Bellecour in Lyon worth a total of 5.5 million francs, she also left the Pasteur Institute a vineyard right in the heart of the Brouilly and Côtes-de-Brouilly appellation, in Saint-Lager in the Rhône, which still belongs to the Institute. The property was inalienable and its purpose was to train grape-growers and winemakers, logically enough given Pasteur's work on wine. As a vineyard owner and winemaker, the Pasteur Institute today produces the equivalent of 120,000 bottles.

In 1944, the Pasteur Institute received its first overseas bequest, in the form of 2 million francs left to it by Eugénie Singer, an American by birth who had become Princesse de Polignac. The bulk of her immense fortune was entrusted to the Singer-Polignac Foundation. Another bequest, from Mademoiselle Cécile de Saulces de Freycinet in 1945, brings to mind a moment in the history of the Third Republic. Her father, Charles de Freycinet, was a colleague of Gambetta's in 1870 and special deputy during the Franco-Prussian war. Senator, Minister of Public Works, he served four times as President of the Council (prime minister), most frequently entrusted with the Foreign Affairs or War portfolio. Minister of State in 1915-1916. By coincidence, Freycinet's secretary in 1879 was René Valléry-Radot, Pasteur's son-in-law.

Other noteworthy bequests in the years that followed included that of Madame Darré, widow of Henri Darré, a physician with long years of service at the Hôpital Pasteur. The legacy added to an earlier donation of 2 million francs for the construction of the building that would house Professor Lépine's virology department.

In 1978, a particularly remarkable legacy in the history of the Institute, appeared, that of Madame Le Savoureux. Lydie Le Savoureux was the

daughter of the Russian revolutionary Georgi Plekhanov, the leading propagandist of Marxism in Russia and co-founder, with Lenin, of the revolutionary newspaper *Iskra* (“the spark”). He died in Finland in 1918 after joining the Mensheviks in an attempt to prevent the Bolsheviks seizing power. Herself a qualified physician and the wife of another, Dr. Le Savoureux, she and her husband ran a nursing home on the Vallée-aux-Loups estate made famous by Chateaubriand.

The Duchess of Windsor’s Bequest

It was in the late 1980s, however, that the Pasteur Institute was to receive the most widely reported bequest in its history. On April 24th, 1986, every radio station was announcing the death of the Duchess of Windsor. She was buried at Windsor on April 29th, in the presence of the full complement of the British Royal Family and of many French friends, including Hubert de Givenchy. On May 1st, her executor, Maître Suzanne Blum, announced to the press that the Duchess had made the Pasteur Institute her legatee by universal title. Naturally, this caused a considerable stir at the Institute!

Everyone knows the story of the abdication of King Edward VIII, announced in a radio broadcast on December 11th, 1936:

You all know the reasons which have impelled me to renounce the throne. But I want you to understand that in making up my mind I did not forget the country or the empire, which, as Prince of Wales and lately as King, I have for twenty-five years tried to serve. But you must believe me when I tell you that I have found it impossible to carry the heavy burden of responsibility and to discharge my duties as King as I would wish to do without the help and support of the woman I love.

The King abdicated in order to be free to marry Wallis Garfield, an American already once divorced and married to a second husband, Ernest Simpson. Their divorce became final on May 3rd, 1937 and the former King, now the Duke of Windsor, married Mrs. Simpson in Candé, on the banks of the Loire, on June 3rd, 1937. Not one member of the Royal Family was present: the ceremony was attended by only a few close friends, including the Duchess’s aunt, Aunt Bessie, who was privy to the details of her relationship with Edward VIII from its earliest days.



Photograph of the Duchess of Windsor at the Chateau de Candé, April 25, 1937, used on the cover of the catalogue for the auction of her jewels. (The Cecil Beaton Studio Archive at Sotheby's)

This extraordinary story of the monarch of an immense realm (he was still Emperor of India at the time) renouncing the burden of his duties to marry a twice-divorced American was to leave a lasting mark on public opinion, first and foremost in Great Britain, where the populace was stunned and shocked; in America, because she was an American; in France, where the Windsors had taken up residence, and throughout the entire world. In later years, the glittering life they led often saw the Windsors featured in the society columns of the French press and among the international jet set.

The Windsors met with a particularly warm welcome in Paris, both from successive French governments and from the Paris city council, whose tenants they were. This explains why the Duchess chose, on her death, to express her gratitude towards the country that had welcomed them. And hence her choice of an internationally renowned institution symbolic of real France. Since some of her very dear friends were linked to Pasteurian figures, Sarah Rapkine in particular, she decided to leave the bulk of her fortune to the Pasteur Institute, apart from smaller bequests to members of her household and a handful of charities in which she also took an interest (guide dogs for the blind, sea rescue, children's villages, etc.). The only member of the Royal Family mentioned in the Duchess of Windsor's will was Princess Alexandra of Kent. But Queen Elizabeth let it be known she was delighted the Duchess had chosen the Pasteur Institute as beneficiary of her generosity.

The Duchess had also taken care during her lifetime to make a notarized donation to French national museums: all her sumptuous 18th century furniture went to Versailles and the Louvre, and an extremely rare collection of trompe-l'oeil porcelain was donated to the Sèvres Museum.

The Duchess of Windsor's jewels – the bulk of the estate – went to auction at a prestigious sale organized by Sotheby's in Geneva on April 2nd and 3rd, 1987. Yet the sale, of such importance to the Pasteur Institute, almost did not take place.

The Pasteur Institute had initially envisaged selling the collection privately to Mohamed Al Fayed, owner of the Ritz Paris, who had already purchased the contents of the Windsor's home in the Bois de Boulogne with the avowed intent of creating a Windsor museum (which he never did). As he was unwilling, however, to accept the delay imposed by the Pasteur Institute before sale of the items, the Institute decided to send all

the jewelry, personal items, photographs, silverware, etc. to auction. Apparently, this decision annoyed Mr. Al Fayed intensely.

Michèle Barzach, Minister of Health at the time, contacted the Institute at the beginning of March 1987 and pressed hard for the Institute to abandon the auction and sell the collection privately to... none other than the selfsame hotelier. There could be no question of doing so: the auction had been advertised all over the world, the catalogue printed, and every effort made by Sotheby's to make the sale a truly special event. The Institute stood firm and rejected this peculiar proposition. The auction, superbly organized by Sotheby's, went ahead. In fact, it went very well indeed, reaching 300 million francs, compared to an initial estimate set at around 55 million francs.

Obviously, the discretion so dear to the Pasteur Institute had to be abandoned for the time being. Thanks to the bequest and the auction, the name of the Institute was featured prominently in newspapers and magazines worldwide for several months, providing free publicity the Institute could otherwise never have afforded. This was the first ever auction of the personal belongings of a high-profile figure, and paved the way for other successful auctions of its kind, of the possessions of Jackie Kennedy or Maria Callas, for example.

Under a marquee on the shore of Lake Geneva, opposite the Hôtel Beau-Rivage and only a few meters from the spot where the Empress of Austria had been assassinated in 1897, the jewels were paraded by Givenchy models before a crowd of some one thousand five hundred people, including many from overseas, others taking part via live link-up from New York, all under the capable eye of a peerless auctioneer, Nicholas Rayner, a former British Army officer and director of Sotheby's Geneva branch.

In the preface to the catalogue, Mr. Rayner emphasized the exceptional quality of the collection amassed by the Duke of Windsor: he had a great love of jewels, would discuss their design with the top designers at Cartier or Van Cleef & Arpels, and much appreciated the decorative art of the 1940s-1950s, which was well represented in the collection. Repeatedly singled out by fashion magazines as the most elegant woman in the world, the Duchess of Windsor had an innate fashion sense and, often seen in Chanel, Schiaparelli or Poiret, knew exactly how best to set off such avant-garde pieces.

The jewels were laid out for two days on large tables in the basement of the Banque de France, and several inventories were drawn up, including one by the Chaumet Brothers. They had called me at some point after the Duchess's death to inform me that they would carry out the appraisal free of charge, which they did.

The items put up for auction were for the most part jewels given to the Duchess of Windsor by the Duke. Ranging from a cigarette case featuring the map of their Mediterranean cruises in 1934, 1935 and 1936 to the Cartier leopards and pink flamingos so often photographed and reproduced throughout the world, they represented of highlights of the couple's life together. Even the death of a beloved small dog inspired the creation in 1937 of a pendant decorated with a diamond slipper (Slipper was the dog's name) and in addition to all the jewelry, there were tobacco tins, cigarette cases, silverware, a few family photos, some of them signed (including one that read "from Great Grand-Mama," signed by Queen Victoria).

The auction took place over two days, April 2nd and 3rd, and the mood of the room was feverish from the outset: the first lot, a pair of cufflinks owned by the Duke of Windsor, quickly went for ten times its estimate, and the rest followed suit. The crowning moment of the entire sale came when a 31-carat diamond from Harry Winston, purchased by the Duke in 1950, came up. This was a magnificent gem of peculiar brilliance qualifying it for the category of stones known as Golconda diamonds. It was knocked down under Nicholas Rayner's hammer to a Japanese jeweler, one Mr. Takaji, for the sum of 4.3 million Swiss Francs, equivalent to some 17 million French francs at the time (2.7 million euros). Subsequently, Mr. Takaji sent the Pasteur Institute a check, every year, in memory of an event that had made his jewelry business famous.

The expression "driving up the bidding" took on its full meaning as Nicolas Rayner, switching nimbly from French to English to Italian, whetted the appetite of bidders in the room "against" the invisible potential buyers on the live link-up to New York: "Against you all in Geneva!" The atmosphere was electric, the outcome just as extraordinary and the sale made the headlines of the *Times of London* the following day.

This was a crucially important stage in the history of the Pasteur Institute, not only by virtue of the person of the testatrix, the impact of Edward VIII's abdication, the degree of media interest in the couple and obviously,

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Mr Nicholas Rayner, of Sotheby's, and Mlle Marie-Hélène Marchand, general secretary of the Pasteur Institute in Paris, which will benefit from the sale of the Windsor jewels.

British buyer spends £5m at Windsor jewel auction

From Alan Hamilton, Geneva

A British buyer spent nearly £400,000 which was sold after proceedings with the Duchesse

the financial outcome, but also in that this bequest inspired others; a number of people subsequently expressed a wish to “follow the example of the Duchess of Windsor,” among them Mrs. Eva Sardinia Borthwick-Norton, a wealthy British landowner and, incidentally, a friend of the Duchess. As well as owning the entire village of Southwick in Hampshire and farms and land in Somerset, she also owned a very fine collection of paintings by artists that included Rubens, Murillo, Reynolds, Gainsborough, and more, which she bequeathed to the Royal Academy of Scotland. Worthy of special mention is a unique set of church plate made in 1691 for Southwick Church. As co-legatees (once all the other bequests had been distributed), the Pasteur Institute and the Little Sisters of the Poor felt that, after 300 years, it would be regrettable to sell the plate to an outsider and, rather than break up the collection, donated it to Winchester Cathedral Museum, not far from Southwick, which houses a collection of church plate from parishes in the diocese. A Madame de Lieber, the French-born widow of an Argentinian who never forgot her native country, also bequeathed her fortune to the Pasteur Institute in 1987.

Madame Lépine’s attachment to the Institute was readily understandable; her husband, Professor Pierre Lépine, was an illustrious researcher who spent his whole career at the Pasteur Institute, where he became head of the viruses department. A renowned virologist, he had served as director of the Pasteur Institute in Athens in the 1930s and had developed a vaccine against poliomyelitis. A noteworthy lecturer, member of the Académie des Sciences and of several other learned societies, in France and abroad, a lover of history and of the history of medicine in particular, Pierre Lépine was also involved in politics as a Parisian Councillor.

He was a leading light of the Pasteur Institute and of Parisian life for decades.

Originally from Mulhouse, Madame Lépine belonged to one of the city’s prominent families (Dolfuss) whose wealth stemmed from the textile industry. Having no direct heir, she elected instead to bequeath her possessions to the Pasteur Institute, which was somehow for her the natural thing to do.

An enlightened art lover, as was her husband, Madame Lépine took as keen an interest in the Impressionists as in modern art or Greek, Egyptian and Chinese antiquities. A remarkable sculpture — a dancer by Degas — paintings by Boudin, Renoir, Dufy, Vlaminck, Van Dongen or Gromaire

all featured in the sale, along with jewels by Lalique or splendid pieces of silverware. The sum total of Madame Lépine's bequest to the Pasteur Institute amounted to 25 million francs.

The Pasteur Institute has inherited a great variety of estates, such as buildings in the Paris suburbs of Asnières and Clichy, built by a famous architect and making up the bulk of the estate left by his wife, Madame Compoint: a total of one hundred and thirty apartments would ultimately be sold, with the proceeds going to the Pasteur Institute.

Other examples illustrate how the image of the Pasteur Institute reached far and wide, across all social classes and in every region: a lone wine-grower in Champagne with no family ties thought of the Pasteur Institute. Owning a hectare of vines, a positive goldmine in this sector of the Côtes-de-Blanc, he also had 3 million francs on his bank account, and yet lived in a house, or rather a hovel, lacking in every basic comfort. The notary handling the estate was obliged to buy a suit of clothes so that he could be buried decently.

Some distance from a small village in the Bourbonnais, in a humble and isolated hamlet, a woman farmer lived in conditions that no one would still expect to encounter in the early 21st century: she, too, left all her worldly goods to the Pasteur Institute.

And more bequests from around the World

Since the image of the Pasteur Institute has, as we have seen, never been confined to the borders of France, it has received numerous foreign bequests. Apart from the Duchess of Windsor, a number of others deserve mention here: Madame Marchetti Cantarini, Henry Clarke, Madame Austermann, Mrs. Howard.

The story of Madame Cantarini whisks us off to the terraces of Rome. A successful TV playwright and owner of some ten apartments in Rome, Paola Marchetti loved France and visited regularly for treatment. Indeed, it was in a clinic in Sarcelles, outside Paris, that she died in sad circumstances on October 9th, 1991, abandoned by her Italian "friends," including an attorney and a notary. She had initially appointed the attorney as her executor, and the two of them as legatees by particular title to the sum of 500,000 francs each. Despite her worsening illness and her solitude, they failed to even come to visit, which prompted her to alter her

will. In view of her great admiration for the Pasteur Institute and its research, she made the Institute her legatee by universal title, and appointed its Secretary General as her executor.

I visited her in that Sarcelles clinic two or three days prior to her death, of which I was informed by telephone when I called for news of her a few days later. At the same time, I also learned that the Italian attorney had already taken steps to repatriate her body to Italy. I called him at once and informed him that I was the executor, which was not good news for him, and that henceforth it would be my responsibility to act. I jumped on a plane to Rome with Frédéric Grosjean, who later succeeded me in the Bequests department, to present the attorney with the will, which I left him to read. When he discovered that his legacy, along with that of the notary, had disappeared, he fell into a silent but spectacular fit of trembling. I then embarked on a series of formalities, starting with the district court in Rome, in the north of the city, where officials more reminiscent of a Communist bureaucracy or a third-world country covered the reams of testamentary documents with rubber stamps and signatures.

In my position as executor, I was able to ensure that Paola Cantarini received a fitting burial, something that her so-called “friends” made light of, with a religious ceremony held in the cemetery church. The Pasteur Institute would receive some fifty million francs, as the estate was settled without difficulty and the apartments in Rome were sold with the aid of the French Embassy’s legal counsel, Agatino Alajmo. Scholarships for postdoctoral researchers, established in accordance with Madame Cantarini’s wishes, keep her memory alive in concrete fashion. In recognition of and tribute to her generosity, a number of plays written by Paola Marchetti were staged during Pasteur Year in Rome and in Naples, but also in Prague, New York, Buenos Aires and Sydney, all cities with large Italian populations.

On the heights of the ancient village of Roquebrune, an old house known as “l’Aumônerie” nestles near the church, no doubt once the rectory, built up against the cliffside. It is a house with several floors, irregular in shape, dotted with little staircases and charming corners. A kitchen in the form of a mysterious grotto and a terrace garden look out over the Mediterranean. In the distance, Monaco can be discerned.

This little corner of paradise was once owned by the fashion photographer Henry Clarke, the most Parisian of all American photographers. He arrived

in Paris in 1949 and soon made a name for himself as “the” photographer at French *Vogue*. From Christian Dior to Balenciaga and Jacques Heim, all the great couturiers sought out his services, and Henry Clarke worked with all the most famous models of the day: Bettina, Suzy Parker, Fiona Campbell, Veruschka. He traveled widely, snapping fashion in Paris, London and Rome, or in more exotic settings such as Brazil, India and Iran, for the greater pleasure of *Vogue* readers. More than a mere fashion photographer, he was a real artist who also made astonishing portraits of famous figures including Katharine Hepburn, Anna Magnani, Maria Callas, Cary Grant, and the Duke and Duchess of Windsor. Inspired by the Windsor’s generosity and alive to the suffering caused by cancer, he decided to bequeath his possessions to the Pasteur Institute. Having lived in France since the 1980s, he joined the ranks of those wealthy Francophile foreigners prepared to donate their worldly goods to an internationally renowned French institution, which they considered in a way as the symbol of France.

Henry Clarke died in 1996 and named the Pasteur Institute as his legatee by universal title, while leaving to the Galliera Fashion Museum in Paris his collection of photographs, constituting a remarkable archive.⁵⁵

The Pasteur Institute thus inherited the rest of his fortune in France and in America. A magnificent sale at auction was held in Monaco on June 20th, 1998, staged admirably at Christie’s by Bertrand du Vignaud and presided over by the event’s honorary chairman, Hubert de Givenchy. It was attended by many antique dealers, lured by Henry Clarke’s taste for the unusual.

The proceeds from the sale, two or three times higher than initial estimates had suggested, amounted to 12 to 13 million francs. The auction was preceded by an event at Christie’s New York to attract potential US buyers. All told, his estate sold for a total of 31 million francs.

Among the rare and precious objects sold were a terrestrial globe dating from the early 18th century, a pair of 1950s pineapple planters, and four Italian plaques in hard stone. The Roquebrune house was sold to an American from Chicago.

Among the international bequests, another name worth mentioning is that of Madame Ursula Austermann-Hecht, of German origin but who had settled in Canada where she made a late marriage with the Austrian Consul

in Vancouver. He died shortly after their marriage, and it was only then that she discovered that she could have inherited a huge fortune from him: her husband, an influential and mysterious industrialist, had set up a foundation, of which he mentioned not a word to her, and to which he left the bulk of his fortune. Following the death of her husband, Madame Austermann decided to return to live in Germany and began to have her possessions packed up in view of moving back to Europe. As she was unable to decide where she would ultimately like to settle, however, her possessions were to remain for years in a warehouse in Hamburg where, after her death, the Pasteur Institute discovered it intact. Her furniture, including a fine Biedermeier set, would eventually be sold in the small town of Bielefeld (Westphalia).

Then there was the substantial bequest left by Mrs. Frank Howard, of Serbian origin, who had married an English husband and made her home in the United States, while making regular visits to France. She took a great interest in the future of young people embarking on a career in research and made an initial donation of 1 million dollars to endow scholarships.⁵⁶ On her death, the Institute inherited the sum of 60 million francs from bank accounts and a trust fund, shared with the Memorial Sloan Kettering Cancer Center in New York.

And why not end with a mention of the bequest left by the Baronne von Knapisch, an Austrian who made her home in New York? She never forgot her detailed memories of how the Hôpital Pasteur took care of her. She had been treated, free of charge, as a child.

From One Surprise to the Next

The settlement of estates sometimes springs a good many surprises, and some examples are quite revealing. The first took place in Cannes. During her lifetime, Madame R., the owner of a magnificent apartment in the Californie district, with views over the entire bay, gifted part of that apartment to her Spanish servant, who was thus enjoying the use of an apartment in a superb location. Madame R.'s will also set aside the sum of 400,000 francs for Conchita, and it was my happy task to tell her the good news. Her response was immediate: "Madame always said 500!" What is written is written: the bequest was thus 400,000.

Imagine our surprise when the terms of one will required the Pasteur Institute to open a special bank account to manage an annuity intended

for... a small dog! Naturally, the Pasteur Institute kept in touch with the vet for regular updates on the animal's welfare. This last wish is perhaps easier to understand given that the dog in question was the sole concern, and probably the sole companion, of the deceased.

Another truly staggering example cropped up with the estate of Madame S., Austrian by birth, who had made the Pasteur Institute her legatee by universal title. She had been a painter, based in Paris, where she lived in a modest apartment in an unpretentious building. Under the terms of her will, Madame S. had wished to be cremated and her ashes deposited in Igls, near Innsbruck. When I contacted the Austrian Embassy, I discovered to my amazement that the formalities had already attended to, with no involvement whatsoever on the part of the Pasteur Institute, the sole authority in this matter, and by none other than the President of the highest court in France, the Final Court of Appeals! This individual had no family ties to Madame S., was not mentioned in the will, therefore had absolutely no authority to act. I reminded him that, as the twelfth most eminent officer of State, he had a responsibility to uphold the law. He, in return, accused the Pasteur Institute of "acting too bureaucratically."

And then there was the adventure of the Vidal estate, settled in 1980 but which reappeared on the agenda in 1994 as a result of the fall of the Berlin Wall. André Vidal was a military attaché in Berlin during the 1920s, at the time of the Weimar Republic, when the foreign staff posted there enjoyed purchasing power that enabled them to buy property beyond the means of native Berliners, impoverished by rampant inflation. He later went into industry, was made Chevalier de la Legion d'Honneur, and died in 1980, naming the Pasteur Institute as his legatee by universal title. His substantial estate (3 million francs) was settled within months. In February 1994, the Pasteur Institute was contacted by the Paris branch of a German firm of professional genealogists, which had finally tracked the Institute down. It appeared that, in 1923, Colonel Vidal had purchased a 780 square meter plot of land situated behind the Brandenburg Gate and consequently in what was to become East Berlin, adjacent to the famous Unter den Linden avenue, Parizer Platz and the Charité hospital.

The land had been expropriated by the GDR, but the fall of the Berlin Wall changed everything. The Pasteur Institute declared itself on its honor as the legal heir of Mr. Vidal and was granted a certificate of inheritance as not only French but German heir by the German Consulate in Paris. The Institute thus became the owner of this real estate, for which a

construction permit had already been granted, and sold it in December 1995 on very good terms.

On occasion, legacies bring you into contact with the surviving families, who are generally less than pleased to have been disinherited. The representative of the Pasteur Institute becomes a lightning rod for this disappointment, which is all the greater when the estate is a substantial one. The notary to a very large estate bequeathed to the Institute phoned me to draw my attention to comings and goings in the apartment of one Madame X in the days immediately following her death. It was a very impressive apartment in the luxury 16th arrondissement of Paris – fine furniture, beautiful paintings, magnificent silverware, etc. – and he advised me to have the locks changed at once since, in principle, no one but the executor was now authorized to enter the apartment. So off I went with the Institute’s locksmith in my wake, only to find several members of the deceased’s family busy sifting through papers. No provision for the family had been made in the will: the Pasteur Institute was the legatee by universal title and, unfortunately for them, they had no further right to intervene in any capacity whatsoever. This was clearly very difficult for them to grasp, given the (very real) affection they felt for their aunt.

I heard one of the nieces exclaim, in a strangled voice, “It’s the Pasteur Institute!” as our arrival interrupted their paper chase. We made the inventory room by room, with the notary, auctioneer and estimator in attendance, and came upon the niece once again going through papers in the desk. Since she ignored the notary’s injunctions to cease and desist, he asked me to take over the disagreeable task of making her realize that she had overstepped the mark and it was for the Pasteur Institute, and the Pasteur Institute alone, to take any further action. She ended up quitting the apartment, trembling with emotion, and we changed the locks behind her. *Dura lex, sed lex...* Luckily, a paper turned up listing a certain number of gifts for various persons, which meant that the Pasteur Institute was able to hand over to the niece a keepsake of great sentimental value.

Another extremely disagreeable memory: being called in to be interrogated by the major crime squad and by the investigating judge for financial crimes regarding a charge filed by the legal guardian of a very elderly lady against a well-known auctioneer and estimator of estates. A number of people were questioned regarding this considerable estate, from which the household staff, the gardener and the building concierge were helping themselves liberally to money withdrawn from the bank every

week... until the day the bank, suspicious of such regular and large withdrawals, alerted the authorities.

The nature of the legacies bequeathed to the Pasteur Institute is extremely varied: securities portfolios, apartments, buildings, bank accounts, works of art, etc. Perhaps the most touching was a simple gold wedding band. The list also includes some more surprising items, ranging from a pornographic cinema on boulevard Saint-Michel to public baths frequented by a somewhat insalubrious clientele, to a majority shareholding in a real estate company that happened to own the Crazy Horse cabaret (the shares were quickly sold off before the press got wind of the bequest!). Opening up bank safety deposit boxes can also produce its share of surprises: sometimes they are full of gold, sometimes empty, but they can also contain a later will that casts doubt upon the entire settlement process under way on the basis of an earlier will, leaving heirs stunned but stoical at being completely left out of the loop!

However it may be, the settlement of estates invariably makes a dramatic incursion into the most private corners of the testator's life, and there is often a very narrow dividing line between fiction and reality.



The François-Jacob Center inaugurated on November 14, 2012, is dedicated to research on emerging diseases.

CONCLUSION

I hope the reader now has a more detailed idea of the Pasteurian universe.

Visitors to the Pasteur Museum often feel a sense of familiarity as they wander through the various rooms in Pasteur's apartment, delighted to find a precise setting for those somewhat faded memories from their school days: Pasteur, rabies, Joseph Meister... Perhaps this book may have helped to rekindle old memories, and to reveal less well-known aspects of the Pasteurian legend. While many of the subjects addressed could well be explored in greater depth (as La Fontaine said, "And, on the best of themes, I hold, the truth should never all be told"⁵⁷), I hope that my words have made their contribution to the history of the Pasteur Institute.

What does the future hold for this Institute that has counted for so much in the history of science and of France? My hope is, of course, that it will continue along the glorious path it has followed for so many years and will remain a leading light in research into infectious diseases, although the competition it faces today is far fiercer than when it occupied an almost unique position long ago. The Pasteur Institute is fortunate in having such a particularly prestigious past, and the challenge now is to hold on to that spirit while nonetheless adapting to the modern era.

The Pasteurian model that has guaranteed the Institute's independence must be maintained, with the support of private donors and industrialists. The Pasteurian spirit, i.e. the constant desire that research should, through its application, contribute to the improvement of public health, will continue to drive the core of its activity.

In this regard, the Pasteur Institute, heir to a long tradition, bears a message particularly well suited to the globalized 21st century. As we have seen in recent years, infectious diseases remain a major danger for the entire world: the spread of AIDS in the 1980s, the lightning outbreak of SARS at the beginning of the 2000s, the threat of avian influenza closely followed by the Ebola virus and the Zika-carrying mosquito have underscored the real risks of infection around the world. Growing urbanization, climate change and movements of population have accelerated the circulation of infectious agents and are making public

health a truly global issue: “Humankind itself is creating the conditions in which epidemics will once again prosper,” Christian Bréchet, a former President of the Pasteur Institute, recently wrote.

The Pasteur Institute, which has taken the full measure of the danger, will continue to be especially well placed thanks to its presence in high-risk countries.

Inspired by the humanism and the desire to alleviate suffering of its founder, the Pasteur Institute will remain fully capable of confronting the public health challenges that each generation will continue to encounter.

Spring 2018

NOTES

¹ Raymond Dedonder, Maxime Schwartz and Philippe Kourilsky.

² François Jacob, Marcel Boiteux, Bernard Esambert, Philippe Rouvillois and Michel Bon.

³ Some were recently replanted.

⁴ Author's note: those are Sister Laure's words. Rabies is not classified as a contagious disease.

⁵ The preparations for the visit were military-style. The Ministry for Foreign Affairs and the security services reconnoitered the premises, the laboratories visited and the route the VIPs would take were carefully scrutinized, the visit itself was broken down into its component stages, paying attention to every detail, as each stage might prove a source of difficulties or the unexpected. Needless to say, when the VIP visitors left the Institute safe and sound, the person in charge of organizing the visit breathed a hearty sigh of relief!

⁶ "The work on silk worms made its mark as the first model of experimental science in the battle against disease" (Annick Perrot and Maxime Schwartz, quoting Emile Roux).

⁷ After his death, as a devoted widow she took part in many ceremonies dedicated to the memory of her husband, unveiling monuments in Arbois (1901), Dole (1902), Marnes-la-Coquette (1903), Chartres, Lille, the Place de Breteuil in Paris (1904), at the Ecole Normale, etc., all ceremonies which she certainly encouraged and no doubt approved of.

⁸ Pasteur, exhausted, was escorted into the auditorium on the arm of the French President and was greeted by a standing ovation.

⁹ Caitlin Hawke, *Pasteur Perspectives*, Fall 2007.

¹⁰ A. Delaunay, *L'Institut Pasteur, des origines à aujourd'hui*, Paris, France Empire, 1962.

¹¹ A defensive reaction against a microbe by the cells of the organism.

¹² Suspended during the war, the "grand cours" was revived in 1922 by Legroux, and directed by him for 25 years. Over time, his approach evolved and independent microbiology courses would appear: immunology, general bacteriology, systematic bacteriology, general virology, etc., all the way through to the most recent current disciplines: genomics, genetics, neurosciences, cellular biology, etc.

¹³ A. Delaunay, *L'Institut Pasteur, des origines à aujourd'hui*, *op. cit.*, p. 177.

¹⁴ A. Lwoff, *Jeux et Combats*, Paris, Fayard, 1981.

¹⁵ A mishap of a similar sort happened to François Jacob, as he recounted at the 20th anniversary of INSERM, and in his eminently readable autobiography *La Statue Intérieure*. After the war, he went to see the director of the Institut National d'Hygiène to express a wish to work in genetics. The director asked who his superior was. In fact, he had none, having joined the Free French in June 1940 and

returned severely war-wounded. At that point, the director told him he was not interested in genetics!

¹⁶ Agnès Ullmann (ed.), *Origins of Molecular Biology. A Tribute to Jacques Monod*, 2003.

¹⁷ In June 1983, daily newspaper *Libération* orchestrated a campaign against the Hevac B vaccine, accusing subsidiary Institut Pasteur Production (IPP) of using contaminated plasma from the USA in its manufacture, under the headline “L’Institut Pasteur malade du cancer gay” (The Pasteur Institute has Gay Cancer). An outraged François Jacob, then Chairman of the Board of Directors, called a press conference to defend the Institute against the charge. A very discreet retraction was published, months later, on an inside page of the newspaper. In the meantime, IPP had lost its foothold in the German market...

¹⁸ An article in the *New York Times* (March 17th, 2001) reported that Luc Montagnier’s plan of moving to Queens College in New York had come to nothing since the necessary funding could not be raised, the only US patron to have committed to the plan had requested a refund, and the President of Queens had to resign.

¹⁹ PVR, Pasteur’s grandson - physician, professor at the faculty of medicine, Resistance member, member of the French Academy, co-founder of the RPF with General de Gaulle, member of the Chamber of Deputies and author (*Mémoires d’un non-conformiste*) – was clearly a multi-faceted character. He was also a member of the Constitutional Council. Less well known perhaps, all his actions as a member of the military tribunal charged with the court martial of General Salan,

Due to PVR, a plea for mitigating circumstances saved Salan from execution. As a result, de Gaulle never again invited him to the Elysée Palace. PVR also trained whole generations of great physicians such as Professors Hamburger, Lhermitte, Milliez and Halpern.

²⁰ The publication in English of three sections of the journal *Annales de l’Institut Pasteur* (“Research in Microbiology,” “Research in Immunology,” “Research in Virology”) dropped a bombshell in spring 1989, with journalists from Quebec took violent exception to Schwartz’s initiative. This perfectly logical decision sought to halt the inevitable decline of the French journal, unable to compete with the English-language journals now that English had become the lingua franca of scientists. The affair caused a huge stir: Alain Decaux, then Minister in charge of French-speaking countries at the Ministry of Foreign Affairs, publicly expressed his deep displeasure and condemned the Institute; donors wrote in threatening to withdraw all future support from the Institute. The image of Pasteur was sullied! Management changed tack, establishing a new journal, *Annales de l’Institut Pasteur: notes, débats et résumés*, most notably featuring abstracts in French of articles published in English. Calm was gradually restored, but it had been a rude awakening for the director, responsible for the public perception of the Institute.

²¹ *Le Monde*, March 10th, 2004.

²² There is ongoing debate over the spelling of the French term “pasteurien,” to which some prefer “pastorien.” André Lwoff opted for the former in an article published in *Le Figaro* on May 2nd, 1973, “Être pasteurien.”

²³ Staub (Anne-Marie), *Emile Roux, 17 décembre 1853-3 novembre 1933, Centenaire de l'Institut Pasteur 1887-1987*, an Institut Pasteur publication.

²⁴ “*La science franco-britannique et la guerre*,” *Dialogues*, n° 1, July 1946, p. 29-33.

²⁵ Speech by Dr. Jean-Pierre Digoutte, director of the Institut Pasteur of Dakar, Pasteur Year symposium, April 10th, 1995.

²⁶ Ferry actually imposed this policy, to the fury of the right and of the radical faction of the Republican party: “If France wishes to remain a great country, exercising all of her rightful influence over the destiny of Europe, [she ought to carry] wherever she can her language, her customs, her flag, her arms and her genius.” (*Discours et Opinions de Jules Ferry*).

²⁷ A. Malet & J. Isaac, *Histoire contemporaine de 1852 à 1920*, higher primary education, Librairie Hachette, 1937.

²⁸ It was not until 1978 that the program launched by the World Health Organization to eradicate smallpox worldwide finally achieved its target.

²⁹ Jean-Paul Moreau, *Un pasteurien sous les tropiques*, Paris, L’Harmattan, 2006.

³⁰ While the Zaire Institute no longer has links to the Pasteur Institute, the Bangui Institute is still a member of the network and very active, particularly in AIDS research.

³¹ Reorganized in 1946, under the impetus of Marcel Baltazard and with the support of the Shah, it was for several years the jewel in the crown of the Pasteur Institutes overseas.

³² It was due to dysentery, contracted during his stay, that Calmette was constrained to return to France after two most active years.

³³ H. H. Mollaret & J. Brossollet, *Alexandre Yersin ou le vainqueur de la peste*, Paris, Fayard, 1985.

³⁴ *Ibid.*

³⁵ Designed by the architect Delmas and Annick Perrot, then curator of the Pasteur Museum.

³⁶ Charles Nicolle, *La Narquoise*, Paris, Calmann-Lévy, 1922.

³⁷ Speech given by Charles Nicolle in Rouen town hall on the occasion of the Osiris prize, October 22nd, 1928, quoted by Maurice Huet in *Le Pommier et l’Olivier. Charles Nicolle, une biographie*, Montpellier, Sauramps médical, 1995.

³⁸ The Institut Cantacuzène, which escaped Ceausescu’s depredations, was modeled on the Pasteur Institute, bringing together on a single site: research laboratories, a teaching center and a vaccine production unit. As in Paris, the tomb of the founder is open to visitors.

³⁹ She is referring to the cooperation between the Pasteur Institute of Cambodia, the National Agency for AIDS Research (ANRS) and the Cambodian Ministry of Health.

⁴⁰ It should be noted, however, that Pasteur declined the Prussian Ordre du Mérite in 1895, after having returned the diploma awarded to him by the University of Bonn in 1871. Despite his admiration for how well research in Germany was organized, his patriotism had been sorely wounded by the 1870 Franco-Prussian War. An engraving inspired by the painting by Henner, entitled *L’Alsace. Elle*

attend (Alsace awaits) occupied a prominent place on his desk. It depicts a woman in full mourning, symbolizing the pain of the lost province.

⁴¹ The letters sent by the Emperor are kept in the Bibliothèque Nationale, and Pasteur's to him are kept in the archives of the imperial villa in Pétropolis, the Emperor's summer residence in Brazil, not far from Rio de Janeiro.

⁴² Bert Hansen, "How medicine became hot news, 1885," *Picturing medical progress from Pasteur to polio, a history of mass media images and popular attitudes in America*, New Brunswick, Rutgers University Press, 2009.

⁴³ He currently heads the Pasteur Institute of Laos.

⁴⁴ The President of Bloomingdale's had been severely wounded during the Ardennes campaign in the autumn of 1944; French doctors saved his life, and he was immensely grateful to the homeland of Pasteur.

⁴⁵ Alain Juppé, Jean-Bernard Raimond, Michèle Barzach, Philippe Séguin, François Léotard, René Monory, Jacques Valade, Michel Aurillac.

⁴⁶ The film was a poetic hymn to the glory of the founder, the great discoveries of his successors and the international fame of the Institute, spreading even into the African brush; the bright colors of the costumes of African women flocking for treatment at a field center run by the Pasteur Institute in Dakar brilliantly underscored why the name of Pasteur is so famous around the world.

⁴⁷ A model of the historic building, a globe showing the presence of the Pasteur Institute around the world, a miniature Italian-style theater representing a battle between attackers (microbes) and defenders (the immune system) and the reconstitution of a laboratory of Pasteur's time and of a modern laboratory, also served to encourage passengers waiting on the platform to pay a visit to the Institute, just 200 meters away. The new station was inaugurated by Health Minister Michèle Barzach.

⁴⁸ Earlier in the year, the French Post Office had also issued two stamps commemorating Jacques Monod and Alexandre Yersin in a special series dedicated to great researchers.

⁴⁹ Paul Brey has spent his entire career to date at the Pasteur Institute, and currently heads the new Pasteur Institute of Laos: he was almost single-handedly responsible for its creation and installation, despite many difficulties. He has proved himself a worthy heir to the first Pasteurians.

⁵⁰ The exhibition travelled to Strasbourg, Dole and Lille.

⁵¹ It was here that he developed his vaccination method.

⁵² This medal has since been awarded every two years to a scientist chosen on the basis of their international renown, their excellence in the Pasteurian disciplines and their interest in public health.

⁵³ "Call 3260 Pasteur" was a hot line for donating to the Institute, "the shortest path to aid biomedical research."

⁵⁴ Indirectly, Claude Debussy had a role in this bequest. Osiris had intended to leave his fortune to his niece, Emma Bardac, but disapproved of her liaison with Debussy (who had abandoned his first wife). Osiris decided to disinherit her in favor of the Pasteur Institute, which had been much talked about since its founding.

⁵⁵ Clarke's collection was presented at the Galliera Museum in a beautiful exhibition in 2002.

⁵⁶ Since 1991, the Frank Howard scholarships have enabled around ten Americans and two Britons to carry out research at the Pasteur Institute.

⁵⁷ La Fontaine, "An Address to the Duke de la Rochefoucauld," *Fables*, Livre 10, Fable XIV.

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