

PASTEUR — THE MAN AND HIS MONUMENTS

BY RENÉ VALLERY-RADOT

[M. René Vallery-Radot is the son-in-law of Pasteur, the centenary of whose birth was celebrated December 27, and he is also author of the great Life of Pasteur which inspired Sacha Guitry's play.]

From *L'Illustration*, December 23
(PARIS ILLUSTRATED WEEKLY)

NEVER have the footsteps of a great man been marked with so many memorials as those of Pasteur. Tablets in stone or marble, medallions, busts, statues, monuments, have been placed in every house in France where he ever dwelt, where he worked, where he gave with frank spirit and a free heart full measure of his scientific knowledge and his human goodness. In the latter part of December and in the months that follow the whole world will celebrate the centenary of his birth as a day auspicious for humanity beyond most others; for Pasteur represents noble and worthy conquests, peaceful, laborious, and beneficent. Many a life that has been protected and prolonged from day to day owes its existence to him.

Proud in her love for him, France has desired each stage in such an existence to be remembered forever. To pause at each point that recalls him is to recollect the various chapters of his life and the sum of his discoveries.

Acts of homage, rendered while he was still upon earth, preceded the efforts of posterity. The humble house at Dôle in which he was born is still standing in a street formerly known as the rue des Tanneurs, which is to-day the rue Pasteur; and upon its narrow front a tablet was placed, in July 1883, to consecrate it as the birthplace of Pasteur. Pasteur himself had been invited to be present at the ceremony, which took place in the open street.

When he saw once more the dwelling that he had left as a child and never seen again, he was seized with deep feeling, and there burst from him these moving words of filial piety, which are easily remembered, so deep is their rhythm: —

‘Oh, my father and my mother, my dear departed ones, who lived so modestly in this little house — it is to you that I owe all.’

The crowd who pressed all about him in the street seemed to surround him with a general tenderness. They had just heard, expressed with all the power of genius, the deep feeling of a heart that felt profoundly. There grew up, not merely at Dôle but at a good many other places as well, a new and different feeling, a personal and intimate cult, love for that very human heart — his glory quite aside. And so when, thirteen years later, after the death of Pasteur, the village of Dôle wished to erect a statue to him, there was a movement in the air through the whole city, like those that blow sometimes among people as the winds blow on the sea. Enthusiasm sprang up and there was generous giving. For three months before the dedication of the monument, the women, the young girls, and the children spent their evenings in making artificial flowers by the thousands and thousands, and garlands were stretched across the street from window to window. Trium-

phal arches alternated with this dazzling profusion of flowers, joyously decking the ancient capital of Franche-Comté.

The lower gate, where many a time had trudged the child who was to transform the scientific, industrial, and medical world, and to bestow on surgery the greatest boldness together with the greatest safety, recalled those filial words of invocation, surrounded with flowers, where all could read: —

‘Oh, my father and my mother!’

The statue rises abruptly on the public promenade. Trees form a semi-circle behind it, lending an air of retirement to its solemnity. Pasteur stands on a tall column of stone, deep in thought, as though seeking the solutions to problems that he alone could find. Standing beside the column, as if supported in the air, appears the figure of Glory, holding out a branch of laurel in one hand, while with the other she supports the column and points upward to the great preserver of human lives. At the base sits a mother with a look of entreaty upon her face, drawing two sick children to her with a movement of tenderness, agony, and hope. At the foot of the monument are the words: ‘Grateful humanity’ — words that sum up the homage of the living and of generations yet to come.

The town of Arbois, situated at a little distance from Dôle, also wished to erect a statue of Pasteur. The two names are so intimately linked that it was thought for a long time Pasteur was born at Arbois. He went there at the age of five. His father, an old soldier of the First Empire, who had been decorated on the field of battle by Napoleon I, had rented the little tannery on the canal at Dôle for only a short time, and for a still briefer period another tannery in the commune of Marnoz, between Arbois and Salins. But in 1827 he saw an opportunity of

securing a tannery on the outskirts of the town of Arbois, and there he kept on working bravely to win bread for his wife and his children.

Besides the first keen and charming memories of youth, Pasteur always had a great attachment for the town of Arbois. He went back there for his vacations; it was a refuge from his work. Letters on the experiments in progress, scientific notes, projected studies — what things were written out and thought out in this dwelling! It had to be somewhat changed for him because of his growing family, and because of the requirements of *franco-comtois* hospitality, but the landscape, which oftenest drew his glances and his thoughts, has remained unchanged. The same vines creep up the hillsides. Pasteur delighted to take the same roads that his father loved to follow at the close of day, when his work was over, and at the same hours. His old schoolfellows were happy to meet him and to hail him as ‘Louis,’ just as they had done in the old days. Those who could not grasp the sweep of his genius knew at least what kindness and willingness for each day’s task were hidden under his cold and grave exterior.

To-day, almost in the centre of the town, in the middle of the street up which he climbed with slackened pace during his last years, opens a promenade, narrow indeed, but with an air of intimate grandeur in its stone benches and rows of lime trees. There Pasteur sits to-day. His attitude is pensive, his face gently austere, his glance deep and distant. Is it some new subject for research that he is seeking? Or is he preparing again, with all his power of concentrated thought, one of those scientific papers that he wrote in the peace and quiet of Arbois?

He took infinite pains to describe with the utmost clarity the experiments

from which he deduced general laws. He always chose the simplest words. Facts, ideas, hypotheses, deductions leading to the great future discoveries, were all cast in a sober, keen, decisive style, and the Academy of Sciences and the Academy of Medicine heard the reading of these masterly pages, spoken in that strong voice of his which carried conviction with it.

All that laborious past — strenuous, it is true, but so fertile in results that served the common good — sweeps across the memory as one approaches this statue. The bas-relief at the left, with its figures of a vine-grower, a laborer, a cow, a chicken, and a dog caressed by a child, recalls his studies on vines, vaccination, chicken cholera, and rabies. The bas-relief on the right represents a procession of people bitten by mad dogs, who have come from every part of the country to ask for preventive inoculation against the terrible disease, rabies. Behind the statue you see medallions of Pasteur's father and mother, who sleep, after their lives of work and simple living, in the cemetery that you can see back there, with its rows of trees among the white stones.

The trip from Arbois to Besançon is only forty-eight kilometres. It was at Besançon that Pasteur was a student and became later *maître d'études*, or *maître surnuméraire*, as they said in those days. His stay there lasted from the end of 1839 to 1842, and this city, also, wishing to do his memory honor, has placed a bust of Pasteur at the right of the entrance to the lycée. The students may recall those years when Pasteur, then young as they are now, had the especial privilege of being called at four o'clock in the morning by the night watchman, who used to say in a gruff tone of ironic gayety: 'Wake up, Monsieur Pasteur. We must drive away the demon of idleness!'

His schoolfellows felt an esteem for him that verged upon veneration. He had a mind greedy for learning, ever on the alert to go beyond the prescribed course of study. His frank and open heart was always prone to enthusiasm. Moral dignity wrapped him round. The schoolmasters loved him. Everyone predicted that in the future he would become a professor who would possess to a peculiar degree a feeling of responsibility for the training of the students entrusted to him.

In the month of August, 1842, when he left the lycée at Besançon, where he had worked very hard, chance assigned him, in the *baccalauréat ès sciences*, the grade of 'mediocre' in chemistry — a comforting precedent for many students who are too easily discouraged and for others who wish to reassure their parents! The next year he was received in the fourth class of the École Normale, which was then next the Collège Louis-le-Grand. The building, which looked like a cross between a barracks and a hospital, had the dismal appearance possessed by buildings of its kind in old Paris. But something new came into it with Pasteur — youth, faith in science, enthusiasm for the teachers, whose lessons at the Sorbonne he had followed for more than a year. Though the course at the École Normale had its severer aspects, there were compensations in the freedom of working conditions, which favored the student's independence in his studies. To go into the library at will, to consult the journals, the reviews, and the books — all that was an opportunity for earnest young men to develop the taste for personal investigation outside the fixed programmes of study.

A celebrated German crystallographic chemist, Mitscherlich, had published a puzzled little article, almost a challenge, which he offered to the scientific world, on two salts whose

crystalline structure was apparently identical except for their action on polarized light. Pasteur, who had been attracted by crystallographic studies, together with studies in physics, chemistry, and optics, contrived by the most vigorous inductive reasoning, and the most consummate ingenuity, to give an experimental explanation for this optical anomaly. His first discovery opened a great chapter in Pasteur's career, of which we can say here only that it dealt with molecular dissymmetry. He pursued his studies at Strassburg, where he had been named substitute professor of chemistry. They filled all his thought because in his eyes they held the secret of life.

Next June there will rise before the main hall of the Université de Strassbourg a monument to the glory of Pasteur, standing side by side with the monument to Goethe. After the solemn ceremonies that will mark that great event in the history of science and the history of the world, — affirming a desire for peace proclaimed in the name of France, — more than one disciple of Pasteur will go to the modest house in the rue des Veaux, not far from the cathedral, where Pasteur lived with his wife and children. A tablet was placed near one of the windows, twenty-five years ago, when Germany was in full possession.

How could one hope that an act of homage, be it never so discreet, could be rendered to Pasteur in Strassburg while Alsace was still held by its Prussian garrison? Every day the tread of passing soldiers marked the military power of the conquerer, bruising the soil of conquered France. But under the enthusiastic, whispered inspiration of a young girl, a few Alsatians were able to gather at six o'clock one morning, before the street was awake, to place and dedicate the tablet. On this house-front the youthful Pasteur who

really lived in Strassburg has not been represented — Pasteur as we see him in a daguerreotype of 1850, a little stiff, the lips shaven, the eyes clear through the spectacles — but the Pasteur of later days who has become classic. How many Alsatian glances, before the war of liberation, have been lifted to this building, invoking the French genius, the benefactor of all humanity!

Pasteur's work went on at Strassburg. Immense perspectives opened before his imagination and his observation. 'I am led to believe,' he said one day, 'that life, as it is manifested to us, must be a function of molecular dissymmetry and the consequences that follow it.' When, at the age of thirty-two, Pasteur left Strassburg in 1854 to go to Lille as dean of the faculty, he was altogether occupied with his studies of dissymmetry; but, captivating though they were, he was soon to be led, both by the logic of his ideas and by the logic of his feelings, toward the great and at that time obscure subject of fermentation.

While he was at work one day in an old laboratory warmed only by a coke stove in one little corner, the son of a Lille business man came in, who, after having much trouble in the manufacture of alcohol from beets, had come to consult him and ask him to undertake an investigation of the cause of these accidents. Pasteur made this discovery at Lille. He saw in fermentation a phenomenon not of death but of life. In the month of August, 1857, he sent to the Société des Sciences at Lille his memoir on the souring of milk, a paper of only fifteen pages, out of which the whole science of pasteurization was to grow. Their statue to him rises majestically in the place Philippe-Bon. Standing upon the summit of a lofty column is Pasteur, the head a little bent, holding a retort in his right hand at which he is looking with his

usual deep attention. Before the pedestal is a peasant woman, with her face turned toward him, and her child raised in her arms and held up to him in gratitude. Even the baby is holding out his little arms gratefully to the man who saved him.

Pasteur left Lille at the end of 1857, having been called to Paris as assistant director of science and administrator at the École Normale. In two rooms of the school's abandoned granary, in which there was neither preparator nor even a boy to help about the laboratory, he carried out studies that drew the attention of the entire world. In the midst of his work on the ferments, he had to grapple with the question: Where do these little things, which are so very powerful, come from? How could he keep on with the study of the ferments if he could not make out their origin? Were they born of themselves, spontaneously?

The great public chattered about it, influenced by preoccupations that bore no relation to the pure quest for scientific truth. Without preconceived ideas, Pasteur attacked the question of spontaneous generation. It was an obstacle to him in the middle of his study. Once begun, he would not leave off without success, and after having made a great many of the most decisive experiments, he was able to say in his famous lesson at the Sorbonne in 1864: —

No, there is no fact known to-day that justifies the statement that these microscopic creatures come into the world without germs, without parents similar to themselves. Those who pretend that it is so have been the victims of illusion or of clumsy experiments, and are entangled in blunders that they either did not perceive or did not know how to avoid. Spontaneous generation is a chimera.

While the others were still talking, Pasteur had gone back to the infinitely little agents of change. He showed

that the making of vinegar was wholly due to an active little plant, *mycoderma aceti*. He had discovered the main cause for the diseases of wines. He had pointed out the way to combat them by heating the wines, no matter in what quantities, to temperatures between 55 and 60 degrees Centigrade. Already Pasteur suspected the enormous power of infinitely little organisms in infectious illnesses; and then, in the very midst of these experiments and others he had planned, he was called upon to make the hardest sacrifice — he was asked to postpone it all in order to undertake new studies.

A disease that defied all remedies, and the causes of which could not be determined by any study, was gradually ruining the silk-growing regions of France. The losses for the year 1865 ran up to a hundred million francs. Cocoons were either contaminated or suspected of contamination, no matter from what corner of Europe they came. Japan alone was able to produce healthy ones.

Pasteur, earnestly begged to study the problem, was in doubt for some time. 'Just remember,' he said once to J.-B. Dumas, who asked his aid both as a scientist engaged on the problem and as a senator who was receiving anxious petitions from the city of Alais, 'just remember that I have never even touched a silkworm.'

'All the better,' replied Dumas. 'Since you don't know anything about the subject, you will have no ideas except those that come from your own observation.'

Deference for his chief, scientific curiosity suddenly aroused, and the stories of general ruin that stirred a heart always ready to lend its energies to the healing task, led Pasteur to set off for Alais. He reached there on June 6, 1865. With the microscope — the chief means of investigation in all

his studies — he was not slow in discovering that the disease came from certain microorganisms, which were readily visible and which developed mainly in the cocoons and in the adult moths. After that, what was simpler than to make a microscopic examination of the bodies of the females, abraded after egg-laying in a small mortar, to determine the presence or absence of these microorganisms? If none were present, the silkworms that would emerge from the eggs would be healthy.

Pasteur communicated this view of the problem to the agricultural committee of Alais twenty days after his arrival; but he took five years to support with convincing proof and numberless experiments what he had discovered in less than three weeks. Working with his preparators, Gernez, Raulin, Duclaux, and Maillot, in a house called the Pont-Gisquet, not far from Alais, — a house on which a commemorative tablet is soon to be placed as on all other houses where Pasteur ever labored, — what experiments and tests he made to demonstrate the certainty and simplicity of his method!

One would think that, amid the general distress prevailing in the silk industry, Pasteur's method would have been snatched up with frantic haste and tried out. But opposition arose, some of the critics being influenced by stubbornness, others being envious because Pasteur had overturned like houses of cards the theories they had built up, and others simply denying the whole thing — silk merchants who did not want their speculations interfered with. But Pasteur was sustained as always by that glowing faith of his, which those about him understood and admired so much. The years slipped by; results were won; the method came into use everywhere. Immediately after the death of Pasteur, the city of

Alais decided to put up a statue to him. It represents him standing with a branch of heath in one hand, on which the cocoons of the silkworms are spun, while with the other hand he lifts up the fallen silk industry.

America is to celebrate the centenary of Pasteur like that of Columbus. Meetings will be held and monuments raised to the memory of the great Frenchman who is blessed by all mankind. In other parts of the world, on these days of assemblages and dedications, there will be pauses for recollection. Will the true way that humanity must tread become apparent in the glow of those moments? Will the peoples remember the words that Pasteur spoke on the day when his seventieth birthday was celebrated?

'I believe with unshakable faith that science and peace will triumph over ignorance and war, and that the peoples of the world will seek knowledge not to destroy but to create.'

After the silk industry had been saved, agriculture was laid under a debt of gratitude. Three kilometres from Melun, on the Pouilly-le-Fort farm, the great experiment of 1881 in anthrax vaccination was carried out. The agricultural society of Seine-et-Marne, keenly interested in Pasteur's discovery of the possibility of reducing the anthrax virus to a vaccine, offered him two sets of sheep to use for experiment. The vaccine method — announcement of which, as had been the case with other of Pasteur's discoveries, roused the joy of some, who greeted it as a new step forward, and the ironic criticism of others — would thus through a public experiment give proof either of its efficacy, its uselessness, or even, as some whispered, its positive harmfulness. Pasteur planned his experiment as follows: Twenty-five sheep were to be inoculated at intervals of from twelve to fifteen days, first with

a weakened virus and later with a more active virus. A few days later, this first lot of twenty-five sheep, together with the twenty-five of the second lot, — to which nothing at all had been done so far, — were to be inoculated with the most powerful virus of all, the deadly one.

‘The twenty-five sheep that have not been vaccinated will die,’ wrote Pasteur to the agricultural society. ‘The twenty-five vaccinated ones will resist the virus.’ His two collaborators, Chamberland and Roux, in spite of their faith in him, were amazed at such a statement. The most famous of the veterinarians, Bouley, who had become an apostle of the new doctrines, thought that such an uncompromising experiment was too sweeping.

‘He is burning all his bridges behind him,’ he told me with keen anxiety.

When Pasteur entered the barnyard at Pouilly-le-Fort on June 2, twenty-two dead sheep, which had not been vaccinated, were lying on the ground, two more were in their last agonies, and the last sheep of the lot doomed to sacrifice was beginning to breathe hard. All the vaccinated sheep were on their feet and in good health. He was wildly cheered. The insidious attacks of earlier days, the interchange of murmurs, the evil joys that malice once anticipated, had all been swept away by this large-scale lesson. The veterinarians who had shaken their heads, with incredulous smiles, were applauding now with both hands. The battle was won all along the front.

Such are the memories, going back forty-one years, that stir in the breasts of the few survivors of that period as they look up the bank of the Seine, under the trees, to the monument at Melun. A shepherd girl stands there, holding a sheep close to her. Her face is turned toward Pasteur as, with a

charming gesture, she offers him a sheaf of flowers.

Six weeks after the experiment at Pouilly-le-Fort new ones were carried out in the department of Eure-et-Loir. But this time it was not with a cultivated anthrax virus but with the blood of an infected sheep that had died that very morning. The causes of anthrax, the means of its contagion, a preventive method — all had been studied, tried by experiment, and proved. That is why, on June 3, 1903, at a celebration of the agricultural committee, a monument to the glory of Pasteur rose on the place Saint-Michael at Chartres.

When the governor of Algeria wrote to Pasteur in 1893 that the village of Seriana would be called Pasteur in the future, he replied: ‘When a child of the village asks in the future the origin of the name, I hope his teacher will tell him simply that it is the name of a Frenchman who loved La France, and that in serving her as best he could he contributed to the good of humankind. My heart beats as I think that my name may some day waken in a child’s soul the first feelings of patriotism.’

Near Marne is the estate of Ville-neuve-l’Etang, and here, during the years when he was studying rabies, Pasteur established a huge kennel. The State had placed at his disposal the lodgings that had served under the Second Empire for the hundred guards and squires with their horses. Under the clustered beeches he came to rest, in September 1895, and during the lectures and interviews that he still kept up, he loved to glance out over this calm and lovely landscape, his glance still clear and vigorous. Gathered round him under the motionless foliage during these peaceful hours we used to watch the sun sink behind the horizon, and, struck with grief, we used to think in silent sorrow that this glowing life, too, would one day sink to

rest. Sometimes the doctors tried to make us realize it, but we hoped that by our care we might ward off death from him who had so often driven it away from others.

Then, suddenly, death came. It was September 28, 1895. The lower chamber has been left just as he left it. One enters quietly there, speaks in a hushed voice, and feels again in that little space the great life that has gone.

Not far from the place de Breteuil, the Institut Pasteur guards the tomb that was erected by the love of his widow and his children. When the doors that guard the entrance are open you may read the words: *Ici repose Pasteur*.

Then follow these words of his: —

Happy is he who carries a God within him, an ideal of beauty to which he is

obedient — an ideal of art, an ideal of science, an ideal of the fatherland, an ideal of the virtues of the Gospel.

Then you go down a few steps. The marble columns are like a guard of honor about a sarcophagus. Great slabs of marble bear the dates and names of his discoveries. Above the sarcophagus, in a cupola of mosaic on a base of gold, rise four figures with spreading wings: Faith, Hope, Charity, Science.

Between the sarcophagus and the altar, on a simple tombstone, you read: Marie Pasteur. 1826–1910. *Socia rei humane atque divine*.

How many living creatures saved, how many wounded rescued during the war, how many mothers and children snatched back from death have come and still come in ceaseless pilgrimage to this light-filled tomb!

A SPANISH MEMORY

From *Neue Freie Presse*, November 26

(VIENNA LIBERAL DAILY)

IN 1873 I was commissioned by the *Neue Freie Presse* to visit Spain as its correspondent. The country was in a state of transformation. A revolution had occurred just at carnival time, and since the Spaniards attached more importance to the carnival than to the revolution, the latter wore a comic-opera aspect.

I chose the pleasantest route for my journey through the Paradise of the Riviera, constantly in sight of the picturesque Mediterranean coast.

Finally I reached Madrid, the heart of a former World Empire, upon whose whilom dominions the sun never set. My lodgings were in an ancient inn,

once the palace of a cardinal. I occupied an immense, gloomy chamber, whose windows looked out on Puerta del Sol, the most fashionable plaza in the city, so I had abundant opportunity to study the throng of idlers, corner loiterers, and leisurely strollers that have always been so typical of the Spanish capital. They lounged about or walked back and forth in couples, with deliberate dignity, shabby sombreros on their heads, chins sunk deeply into the folds of their romantic, weather-faded capes, with all the air and manner of worthy representatives of Spain's pathetic fate — princes in beggars' cloaks.