

# LOUIS PASTEUR, THE MAN

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*Blessed is he who carries within himself as God an ideal, and who obeys it—ideal of Science, ideal of Gospel Virtues, ideal of Art.*

THEREIN lies the spring of great thoughts and of great actions. Perhaps the ideal of the scientist brings with it a keener knowledge of the Gospel virtues—humility, love, and selflessness—than the ideals of the painter or the composer; for to the scientist is given the power to draw aside the veil from the mystery of Life or Death. Over the place where a great pathologist was accustomed to stand and work, has been placed by one who loved him the motto—*Hic locus est ubi mors gaudet succurrere vitae. Mortuus hic alios dedocet ipse mori*. But how can he be dead, who taught others how to live?

## I.

Of such was Louis Pasteur, whose centenary has recently been celebrated. The son of a tanner, born in 1822, he became "the most perfect man who ever entered into the Kingdom of Science." His father's dreams for him did not extend beyond the honour of a professorship in the College of Arbois, the place of his early education. But Louis's genius, hidden under a boy's shy exterior, had been noticed by his master there in the long walks taken together, and he made it possible for his pupil to go to a preparatory school in Paris, the first step towards entering the "Ecole Normale"—a school founded by Napoleon I with the object of training young professors. Pasteur left for Paris, on a cold rainy day; but we hear that soon, in spite of the "deeper study," his sensitive nature craved for home, and he longed for the smell of his father's tannery.

One morning he was told there was some one waiting to see him at a small café near by. Louis entered, and found his father sitting with his face buried in his hands. "I have come for you," he said simply on seeing Louis, and taking him by the hand brought him back to Arbois. The period of indecision lasted for some time.

but the stirring of his awakened genius could not be hushed. He turned his interest to his talent for portrait painting, but was not happy.

Once more he decided to leave Arbois, but his wise father would not let him go further than the Royal College at Besançon—just thirty kilometers away. It was the boy's first absence from home, and very loving—if pedantic—are the letters he writes to his people. "Love each other," he told his sisters, "as I love you": "Work hard; when one is accustomed to work, it is impossible to do without it." His will was growing stronger; he accepted a readership at the Royal College, and found he could control his pupils, who were also his comrades. Again and again he insisted on the importance of the will in moulding character. "Perfection of will," he wrote, "should be the chief law of man." "Worship great men," he said elsewhere. He read only good books, where great deeds were found. Already at eighteen years of age Pasteur showed an understanding, a pity for humanity, which were to become the religion of his life and work,—that work which later was to absorb him so completely that he cried out against the long hours of the night, in which labour must stop. As yet, he was only groping his way towards science, art, literature. Philosophy and friendship occupied most of his thoughts while at Besançon—friendship, which he must use Montaigne's words to describe as "Something which makes souls merge into each other, so that the seam which originally joined them disappears." Such was the love Louis Pasteur and Charles Chappius bore each other. Together they walked, together they read Lamartine's *Meditations*, or discussed philosophy or art—Chappius realizing even in those early days how far Louis would go.

Thoughts of Paris returned when Chappius left. Louis wished to go with him, but his father held him back, fearing another collapse. His sensitive emotional nature was not yet under control, and he wrote to his friend: "I have just read a book which left me in a flood of tears." This sensitiveness never left him, but in later years it was held in leash by his patience and his power to reason, producing the finely balanced brain of one who was destined to be a leader in the path of science. He finally passed the examination for the "Ecole Normale," fifteenth on the list of twenty-two candidates. When he presented himself once more at the Barbet boarding school, he was no longer a shy and forlorn boy, but one capable of teaching, in return for one-third of his fees. Then, on one of his Sunday walks with Chappius, he turned to his friend in the gardens of the Luxembourg, and in an ardent

manner began to discuss—not philosophy—but Tartaric Acid and Paratartric Acid!

Months passed. His scientific studies began to absorb him. Experiments were tried which were to lead to some of his later discoveries. He had begun to question the correctness of some of the lectures he attended, especially those in chemistry. Dissatisfied with the explanation as to how to obtain phosphorus, he bought some boxes, reduced them to a fine ash, treated the ash with sulphuric acid, and soon had in his possession sixty grammes of phosphorus. From this discovery he gained his first fine rapture in research work. Henceforth he took as his motto: "Onwards". Onward in the service of mankind. He was to touch science with his own fire, until its inmost heart was aflame with his genius.

In 1848 he read to the Academy of Science part of his treatise on Dimorphism, sending a copy of it to his former master, M. Romanet, of Arbois College. So far had the pupil outstripped his master that M. Romanet was bewildered, and wrote on the margin of the paper still on view at the College—"Dimorphism—This word is not even to be found in the *Dictionnaire de l'Academie*"

But science was for the moment to be forgotten. A flood of patriotism and exaltation had stirred France to its depth. Pasteur enrolled himself among the Garde Nationale. He wrote home: "I should be sorry to leave Paris now; it is a great and sublime doctrine which is now being unfolded before our eyes." One day, while crossing the Place du Pantheon, he saw a crowd of people standing near a rough wooden erection, decorated with the words *Autel de la Patrie*. Rich and poor were placing offerings on the altar. He quickly returned to the "Ecole Normale," emptied his drawers of his savings, and returning placed them on the altar. This pleased that old soldier, his father, who advised him to publish his gift in the Journal, *Le Nationale*, as coming from the son of an old soldier of the Empire. The national fever finally spent itself, and Pasteur returned to the study of his crystals.

He had long pondered over a paragraph written by Metscherlich, a Berlin chemist, on "Tartrate" and "Paratartrate" of Soda, wondering, with a beating heart, whether he could solve the mystery. He shut himself in his laboratory, and in December 1847 he wrote to his father:—"I am extremely happy; I shall soon write a paper on Crystallography." Then one day Paris began to say that a young doctor from the "Ecole Normale" had overcome the mystery which had puzzled the brain of the great Berlin chemist. Balard and Dumas became very enthusiastic, but Biot held aloof. Of these three really great men, Louis deferred most to the opinion of Biot.

He wrote to the old man, asking for an interview, in which he might be allowed to show his experiments.

Biot courteously consented. The scene which took place at the "Collège de France," where Biot lived, was worthy of the brush of Rembrandt. The light falling on the stern young face, the eyes filled with the passion of his discovery,—convinced of its truth, he is anxious to convince the tried and illustrious old scientist who looks doubtfully on. There was little place, however, for softness in the complex soul of Biot. "I shall bring you everything that is necessary," he said to Pasteur, wishing to see the experiment made under his own eyes. So he brought Louis doses of soda and ammonia.

After pouring the liquid into a crystallizer, Biot took it into a corner of the room, so that no one could touch it. "I shall let you know when to come back," he said to Pasteur. Forty-eight hours later, small crystals began to form; when Biot thought there were sufficient, he recalled Louis. Still under Biot's eyes, Pasteur withdrew one by one the finest crystals, and wiped off the mother liquid clinging to them. He then pointed out the difference, dividing them into two groups. "So you affirm" said Biot, "that your right-hand crystals will deviate to the right the plane of polarization, and your left-hand will deviate it to the left?" "Yes" said Pasteur. "Well, let me do the rest." He prepared the solution, and again sent for Pasteur. Biot first poured into the apparatus the solution which should turn to the left. Satisfying himself that this had taken place, he took Pasteur by the hand and said—"My dear boy, I have loved science so much during my life that this touches my very heart." Thus Louis Pasteur took his first great step in drawing aside the veil from one of the mysteries of science, that science which "brings Man nearer to God."

## II.

In 1854 he was appointed Professor and Dean of the Faculty of Science in the University of Lille. In his opening address, he spoke of the importance of theory in science. "Without theory" he said, "practical work becomes mere routine." "We have nothing in common," he went on to say, "with those narrow minds which despise everything in science that has no immediate application." Wishing to emphasize this point, he told a story of Benjamin Franklin. "What is the use of it?" said some one to Franklin, while looking on at the first demonstration of a new discovery. "What is

the use of a new born baby?" replied Franklin. "Remember, gentlemen," said Pasteur, "that the theoretical discovery has the merit of its existence, in that it awakens hope." In this way, he began the middle part of his life, taking the microscope as his guide to help him to seek the mystery of God which dwells in science—as, in earlier days, men no more Christ-like sought him through the Holy Grail.

Very soon he was to astonish and puzzle people with his knowledge; to suffer calumny, as all must, who seek the truth. His mind had grown in every way, still emotional, yet balanced by his patience; his power of observation went hand-in-hand with his power to reason. "Chance favours only the mind which is prepared," he said to those who worked with him. To these he became as one inspired, and as one able to inspire, making them feel the desire to work for love of man, and to care little for that shadowy thing called "Fame."

In Lille he found his opportunity to study "Fermentation." Hardly a ray of light had previously penetrated the darkness which surrounded this subject. In 1856 a few timid advances were made by Professor Cagniard-Latour, and a Dr. Schwann; although their observations were alike, they did not pursue their discoveries into what was still a puzzle. The strange and obscure served only to fire Pasteur's genius. In 1856 he wrote to Chappius: "I am pursuing, as best I can, my studies on Fermentation, which are of very great interest, connected as they are with the mystery of Life and Death. I hope soon to make a decisive step by solving, without confusion, the celebrated question of Spontaneous Generation." It had interested man for long. Aristotle, Pliny, Ovid, and Vergil had each discussed it. Now and then, someone came near the truth, especially in the seventeenth century with the coming of the microscope. But it was left to Pasteur to discover:—*La Vie c'est le Germe—le Germe c'est la Vie.*

He had returned to the "Ecole Normale" as director of scientific studies, and there began his investigations. In an article written by the Director of the Natural History Museum, on "Vegetable and Animal proto-organism spontaneously generated in artificial air and natural gas," Pasteur marked the passages which he wished to test. Soon he was in the thick of one of the greatest battles fought in the scientific world. He loved an intellectual conflict, and when he triumphed in his work he speedily forgot the abuse of his adversaries. When reminded of these attacks, in the peace of his last years, he replied—"A man of science should think of

what will be said of him in the following century; not of the insinuations or the compliments of to-day." The modest answer of one who knew his own power; for only genius can afford to wait.

So bitter became the controversy on Spontaneous Generation, that a committee was appointed to inquire into his work. Evening lectures were being held at the Sorbonne, and Spontaneous Generation naturally held a place on the programme. Pasteur was asked to give a lecture, in which he and his work might be said to be on trial before all Paris. The vast audience which filled the Sorbonne had all kinds of people, including the merely fashionable, who wished to whet their jaded appetite on the new sensation of the hour. But literary and artistic France was there also. Before this audience stood a quiet, grave-looking man, his face still young, but full of reflective power, his eyes already a little tired from looking into the unknown. Gently, and with a simple earnestness, he began his address: "Great problems are now being handled, which keep every thinking man in suspense."

He was dealing with a subject to which he had given conscientious study. "Can matter organize itself?" With growing earnestness, and with a touch of scorn creeping into his voice for the ignorance and unfairness of his enemies, he held two flasks before his audience, and asked what difference there was between them. They contain the same liquid; both contain air; both are open; why does one decay, and the other remain pure? In one flask, he told the listening audience, "The dusts suspended in the air can fall into the neck and come into contact with the liquid, where they find appropriate food,—thence microscopic beings." "In the second vase, it is impossible—or certainly difficult—for dusts to enter. They fall on its curved neck." He went on in words simple, yet full of a moving beauty:

Gentlemen, I have taken my drop of water from the immensity of creation, and I have taken it full of the elements appropriated to the development of inferior beings, and I wait and I watch. I question it, begging it to recommence for me the beautiful spectacle of the first creation,—but it is dumb—it is dumb because I have kept it from the only thing which man cannot produce, from the germs which float in the air. For life is the germ,—and the germ is life.

"Now" he said proudly to his audience, amid tumultuous applause, "will the doctrine of Spontaneous Generation recover from the mortal blow of this simple experiment."

## III.

His days had not been filled entirely with work. Love had come to him. While Professor of Physics at Strassburg, he met Marie Laurent, the daughter of his Rector. Two weeks after they met, he formally proposed for her hand. Modestly and innocently he wrote of himself, in a letter to Marie's mother: "I am afraid M<sup>d</sup>le. Marie may be influenced by early impressions, unfavourable to me. There is nothing in me to attract a young girl's fancy. But my recollections tell me that those who have known me very well have loved me." Later, he wrote to Marie: "All that I beg of you, Mademoiselle, is that you will not judge me too harshly, and therefore misjudge me. Time will show that beneath my cold shy exterior there is a heart full of affection for you." Even with this new life before him, he thinks of his work, and says to Chappius: "I who did so love my crystals." Yet he was very happy in his married life; and if sometimes his wife wearied of his absorption in his work, she was great enough to recognize that it must come first.

In 1864 M. Dumas, his old master, asked him to leave his laboratory and go to Alais to inquire into the epidemic which was killing the silkworm trade. Pasteur wished to refuse, having no knowledge of the silkworm, but finally wrote to M. Dumas: "I would have bitter recollection if I did not come to the aid of my country. Do with me as you please." China, that ancient home of beauty, had given to the western world the knowledge of the manufacture of silk. French kings planted the mulberry tree, and the silkworm industry had become very prosperous, so that the French peasant poetically called it "the Tree of Gold." When Pasteur was consulted, all this was changed, and extreme poverty was threatening the peasants. It was the hardest of all the tasks Louis had yet undertaken. For five years he struggled against the obscurity of the epidemic; and when success crowned his efforts, he had to face the dishonesty and the ignorance of those whom he had tried to benefit.

In those too full years of his studies on the silkworm (for he had much other work to do) sorrow pressed heavily upon him. First, the dear wise father passed away, then his beloved daughters—Camille and Cecile—followed within a year or two. Pasteur's tender heart was crushed, and for a time it seemed as if this great and good man would follow those whom he had lost. Struck down by paralysis, he had little hope of his recovery. In the intervals of returning speech he discussed his symptoms with his

doctors. "I am sorry to die," he said; "I wanted to do so much for my country." The bitter cry of the intelligent mind, against the coming of death and its negation! But night was not to set in for that ardent spirit yet. He recovered slowly. Three months after he was taken ill he insisted, although still crippled, on returning to Alais to continue his work on the silkworm.

His illness may have helped to turn the attention of Paris on his work, and on the very unsanitary and inadequate laboratories in which he and other scientific men were forced to carry on their investigations. "Scientific Graves" was the name given to these laboratories by Claude Bernard, whose health had broken down from his years of toil carried out in a cellar of the "Collège de France." Pasteur had already written to Napoleon, asking for a laboratory large enough to carry out the research work he had in view, which—when finished—would lead on to new discoveries. Napoleon loved the peaceful strife of science. It was an escape from the sordid game of politics, which he was forced to play. He had even, before Pasteur's illness, promised to build a laboratory; but the promise vanished away, and Pasteur saw with indignation millions of francs spent on an Opera House, instead of on laboratories.

He had sought nothing for himself, and once, when asked by Napoleon and Eugenie as to why he had not endeavoured to turn his discoveries into sources of legitimate personal profit, he replied: "In France, scientists would consider they lowered themselves by doing so." He spoke for himself and for France, but he spoke also for those who were to follow him, whether of France or elsewhere, into whose love of knowledge the commercial spirit could not enter. But, if he asked nothing for himself, he resolved in the future to ask it for science. With fury he lashed the politicians, who measured their country's greatness by their own ambitions. "Some nations," he wrote, in one attack, "have felt the wholesome breath of truth. Rich and large laboratories have been growing in Berlin for years. St. Petersburg has spent three millions and a half. England, America, Austria, and Bavaria have made most generous sacrifices. And France,—France has not yet begun." His eloquence was such that the tide turned in his favour. Napoleon again ordered laboratories to be built, and French Professors to be given sufficient appliances to compete with their rivals.

#### IV.

Pasteur's work now began to receive some measure of recognition. The coveted ribbon of the "Legion of the Cross" was the



first distinction conferred upon him. Then, in 1867, he received what was to him a still greater honour—the Grand Prize Medal of the Exhibition.

The distribution of prizes was one of the most brilliant events of the reign of Napoleon, a splendid flash before the darkness of 1870 closed about him! The Place de la Concorde, the Avenue des Champs Elysées, were lined with regiments waiting for the emperor to pass. The imperial coach drawn by eight horses was followed by a procession of foreign princes. Among them were the Prince of Wales and his cousin, the Crown Prince of Prussia, and many others who have since borne a part in the making or unmaking of empires. Among the candidates to receive reward for the distinction their work had conferred upon France were Gerome Meissonier, and Ferdinand de Lesseps. The latter, who was the hero of the hour, received great applause as he approached the throne. But little notice was taken of Pasteur, whose work was almost unknown to that vast audience. One spectator, however, tells us how he looked: "I was struck", he wrote, "with Pasteur's simplicity and gravity; the seriousness of his life was visible in his stern, sad eyes."

Later in the year he received a diploma from the great University of Bonn, and the Rumford Medal from England. These honours gave him great pleasure. He looked forward and saw France, England, Germany, as a great Trinity, working harmoniously together in the beloved name of science. But that was not to be. Instead the cry of "Revenge, Revenge" was to ring throughout France. Germany—the "Home of Thinkers"—as Madame de Stael had called it, had turned another side to the world, the bestial side of war. The tender and gentle heart of Pasteur was twisted with pain. He, who hated the brutality of death, saw the youth of his country die. The corridors of the "Ecole Normale" grew silent. "Ah—my lads, my lads, it is all up with us", cried St. Claire Deville, as he and Pasteur watched their students pass out from the peace of the laboratory to the turmoil and chaos of war. Unable to work, Pasteur returned to Arbois: "I cannot go on," he cried out,—as many cried out in our Great War—"all this hurts me; I wish that France may fight to her last man, to her last fortress." "Every one of my future works will bear on its title-page—'Revenge, Revenge, Hatred to Prussia.'" And down through the years since 1870, France, so feminine in her hatred, has echoed the ignoble word—"Revenge."

Paris at last surrendered; and as we read the history of its bombardment, Pasteur's refusal to keep the diploma from Bonn

University can be understood. In his letter to the Head of the Medical Faculty he made mention of the pleasure the degree had given him. He wrote: "Now the sight of that parchment is odious to me. I am called upon by my conscience to ask you to efface my name from the archives of your Faculty." The answer came with characteristic Prussian pomposity, pettiness and bad taste: "Sir, the undersigned, now Principal of the Medical Faculty in Bonn, is requested to answer the insult which you have dared to offer to the German Nation, in the sacred name of its august Emperor King William of Prussia, by sending you the expression of its entire contempt. Doctor Maurice Naumann." A postscript reads: "Desiring to keep its papers free of taint, the Faculty herewith returns your screed."

In the meantime Pasteur had grown calmer, and returned to his work. He brought to each new investigation the vision of a goal, but also the patient reasoning necessary to science. Voices called to him, as they did to Joan of Arc; and like her, he knew not weariness or discouragement. Impetuously he began each step, but patiently he retraced each step, until his evidence was certain. Then, when he was sure of his result, he would reply to his adversaries in these proud words: "when solid proofs confirm my conclusions, no consideration can prevent me from defending what I hold to be true."

He could not help being dramatic when he faced his opponents. In a discussion which took place at the "Academy of Medicine" on child-bed fever, he listened with growing impatience to a colleague who was holding forth on what he thought were the causes of this increasing evil. "None of these things," cried out Pasteur from his seat, "cause the epidemic. It is the nursing and the medical staff who carry the microbe from an infected woman to a healthy one." "That microbe will never be found," retorted his colleague. To the stupefaction of those about him, Pasteur strode to the blackboard, drew a chain of the organism, and turning said, *Tout, voici la figure*—There; that's what it is like. So men learnt that the scourge of puerperal fever was to pass away.

With the drawing of the germ on the blackboard, a new era began in medicine. Pasteur had—as it is said—founded the discipline of bacteriology. He had already shown France how to improve her wines, beers and vinegars. These studies were of great interest to him as a step toward those studies of infectious disease which were to lessen the suffering of man, revolutionizing—as they did—medicine and surgery. Here he was opposed with a bitter enmity and opposition, as in his other studies. "I shall make

them see; they will have to see", he said in one hour of bitterness. And the blind saw, at last, his greatness.

It was while he was investigating an outbreak of chicken cholera that he made his great discovery of vaccine and its use in neutralizing the evil of infectious diseases. Jenner had indeed pointed the way, and it was in honour to that great name that Pasteur continued to call his extended discovery of protective treatment by the name of "Vaccine."

His dream was coming true. The humiliation of France in 1870 was to be blotted out by her great scientific triumphs. The eyes of the world were indeed turning in the direction of Pasteur. He keenly felt the honour—both for himself and for France—in being asked to attend the International Medical Congress taking place in London. His modesty was as great as his genius, so that when he arrived at St. James's Hall the storm of applause which greeted him as he walked to the platform made him turn uneasily to his son and say,—“I ought to have come earlier: The Prince of Wales is arriving”. “But it is you they are greeting,” said Sir James Paget. As an added honour, he was the only scientist mentioned in Sir James's opening speech. “I felt very proud,” he wrote to his wife, “not for myself, but for my country, seeing that I was specially distinguished among the immense concourse of foreigners present, especially Germans, who outnumbered the others.” “After lunch,” he wrote, “I was presented to the Prince of Wales to whom I bowed, saying I was glad to salute a friend of France.” “Yes,” he replied, “a great friend.” “Sir James,” added Pasteur, “had the good taste not to present me to the Prince of Prussia.” Later, however, that great gentleman presented himself to Pasteur.

He returned to his study on swine fever and fowl cholera and anthrax, taking up also Malta fever, yellow fever, and the bubonic plague. Meanness and pettiness still followed his efforts, but his friends stood beside him, encouraging him and helping him in every way. It is good to know that many of his intellectual peers did not fail him. The best proof of their faith in his work came when he was asked to succeed Littré in the “Académie Française.”

It fell to Renan, that master of the French language, to welcome him. The two men, who faced each other on April 27th in the midst of a crowded audience, had almost reached the summit of earthly greatness. And no two men could be more unlike. Pasteur simple, direct and serious in mind and language; Renan subtle and ironic, full of a noble disdain for men, yet believing in their ultimate

good and truth. Clearly and simply Pasteur expressed his thanks at being thought worthy to fill the place of his great predecessor.

In his speech on Littré, who was called the Prophet of Positivism, he shows us his own view of God. While acknowledging what was beautiful in Positivism, Pasteur believed it placed a limit on man's mind. He felt there was a Power greater than any earthly power, greater than the enchantment of science. In that portion of the scientific world studied by pathology, man needs to find God. In the post-mortem room man grows humble; for there Death is almost ignoble and mean as nowhere else. And in that sad place where the pathologist works with Death to aid the living, Pasteur may have found the beautiful faith he has given us in his tribute to Littré:

What is beyond? The human mind will never cease to ask what is beyond. It is of no use to answer—Beyond is limitless space, limitless time or limitless grandeur. No one understands those words. He who proclaims the existence of the Infinite, and none can avoid it, accumulates in that affirmation more of the supernatural than is to be found in all the miracles of all the religions; for the notion of the Infinite presents that double character that it forces itself upon us and yet is incomprehensible. When this notion seizes upon our understanding, we cannot but love. I see everywhere the inevitable expression of the Infinite in the world; through it the supernatural is at the bottom of every heart. The idea of God is a form of the Infinite. As long as the mystery of the Infinite weighs on human thought, Temples will be erected for the worship of the Infinite, whether God is called Brahma, Allah, Jehovah or Jesus, and on the pavement of those Temples man will be seen kneeling, prostrated, annihilated in the thought of the Infinite.

It is said Renan never experienced a greater pleasure than when he welcomed Pasteur. Surely he had never used greater beauty of language than when his genius spoke to the genius of his colleague. The truth which he looked for in men, he found in Pasteur. After denouncing the inability of the "Académie" to understand Pasteur's work, he said:

But there is, Sir, a greatness on which our experience of the human mind gives us a right to pronounce an opinion, something which we recognize in the most varied applications, which belongs in the same degree to Galileo, Pascal, Michael Angelo or Molière, that common basis of all true and beautiful work—that divine fire, the indefinite breath,—which inspires Science, Art, and Literature. We have found it in you, Sir. It is Genius. No one has walked so surely through the circle of elemental nature; your life is like unto a luminous tract in the great night of the infinitesimally small—that vast abyss where life is born.

If Pasteur found delight in these honours, his chief delight was in his work, and when called to Alais to have his name associated as preserver of the silk industry with Oliver de Serres—its founder—he said after the day's celebration was over: "Now let us go back to work."

His investigations on rabies, which he had been doing for some time, were exhausting his strength. His preventive treatment had been successful on dogs; but a long mental and moral struggle took place before he attempted it on man. He had serious thoughts of trying it on himself, when his first patient—a little Alsatian boy—staggered, covered with bites, into the laboratory. His condition was such that it was seen he could not recover. The only hope lay in Pasteur's treatment. Hurriedly he was given the inoculation, and six days later Pasteur saw all was going well. The inoculation was increased in strength, and Pasteur alternated between fear and hope, as he watched day and night beside the bed of the little boy, fear that he was not on the right path in this struggle for man against a deadly evil, hope that one of the greatest medical events in the history of the country was about to take place.

We know now the result of his investigations. But is it possible for the most sensitive to guess the obstacles placed in his way by mean minds inspired with envy and jealousy? "Pasteur is a genius," said one of his friends: "he knows nothing of life apart from his laboratory." But its seamy side was again being thrust upon him. He was accused of hiding deaths, of hiding the failures of his method. "How difficult it is", he said in 1886 on reading a passionate criticism of his work, "to obtain the triumph of truth." "How is it they are not struck by the result as shown by statistics?" His health broke down under the strain; signs of heart trouble were seen. He consented at last to go to Bordighera for a rest, but in exile his thoughts were with his work. Even here he was not allowed to rest. Anonymous letters—the essence always of poisonous minds—arrived by mail; insulting newspaper articles came. "I did not know I had so many enemies," he said sadly.

However, the Academy of Science supported him; his friends stood beside him; and as the insinuations still continued that he kept his failures secret, it was decided that the Annals of the Pasteur Institute would publish a monthly list and bulletins of the patients under treatment. Finally the English Commission appointed in 1886 to enquire into Pasteur's treatment of hydrophobia, after fourteen months' study, laid its report before the House of Commons. The English scientists had verified every one of the facts upon which the treatment was founded. A copy was sent to

Pasteur, who spoke to the Academy of Science on its spirit of entire confidence. "Thus fall to the ground," he continued, "all contradictions; only truth remains".

In the meantime subscriptions had been opened by the Academy of Science to erect a building to be called the Pasteur Institute. A wave of generosity spread from France to other countries. Money poured in. Great artists offered their service. A festival took place at the "Trocadero." Coquelin recited his own verse, written for the occasion. Gounod conducted his "Ave Maria," and at last he turned round and kissed his hands to Pasteur.

The day of the inauguration of the "Pasteur Institute" saw the fulfilment of Pasteur's hope that science would be pursued under better circumstances in the future. It was a day of mingled pain and joy to him, and he was so overcome by his feelings that he had to ask his son to read his address. "Alas," he said, "mine is the bitter grief that I enter here a man vanquished by time." He appealed to the pupils he loved, to his assistants who had shared his work and his scientific faith, to worship the spirit of criticism. "It reduced to itself, it is not an awakener of ideals; but without it, everything is fallible." "If science has no country, the scientist should have one, and ascribe to it the influence which his work may have in this world." The closing words of this very moving address might have been written for us to-day:

Two contrary laws seem to be wrestling with one another nowadays,—the one a law of blood and death,—ever imagining new means of destruction, forcing nations to be ready for the battlefield; the other a law of peace, of work, and health, ever evolving new means of delivering man from the scourges which beset him. The one seeks violent conquests, the other—the relief of humanity. Which of these two laws will prevail, God alone knows.

He entered his Institute, broken and weary, it is true, but he entered it as a conqueror. He had brought the light of his genius into medicine and surgery. Recreating pathology by throwing down the barriers of convention and its followers' ignorance, he had taken living germs—causes of terrible and infectious disease—and had changed them from agents of Death into agents of Life; and, more fortunate than others, he had lived to see the miracles he had wrought put into daily use. What more could he or any other man ask, however broken by work or life? We all know the sweat taken in his laboratory,—goodness and sweetness shining from his face—his eyes bent on the phial he is holding in his hand. That is how we like to think of him—at work—and not as

in that last patient year, when he watched others work instead. But even then he had much given to him; for those who worked loved him as only men love one another, and they sought to carry on his work in a spirit similar to his own.

Shortly before he died, he was carried into his laboratory for the last time. There before him, arranged by his faithful assistant—Dr. Roux—were the little flasks he had used in his studies on “Spontaneous Generation,” which had been so carefully preserved. There were also the little tubes used for the studies on swine. There were many preparations in various culture media, and numerous microbes and bacilli. Two more had been recently added,—the bacteria of diphtheria and bubonic plague. Pasteur looked quietly on his own and his pupils’ work,—the result of many years. “There is still much to do”, he sighed, and turned away.

That same day he received some of the old Normaliens. Seated by the fire, he had a kind word for all as they passed before him in single file. Bowing low over his hand, they said “Farewell.” There was still a little left to him. His old friend Chappius came now and then, to chat with him on philosophy as of old. But more than ever he turned to her—the companion of long years—who knew, as no one else could know, the gentleness and charity of his life. When the end came, she was there—holding her own pain back, as all women do who have served and loved. Then one day, one hand in hers, the other holding a crucifix, all that was perishable of Louis Pasteur passed away. But “They all live who reflect light from the Infinite.”