Briel History of Yellow Fever up to 1905

By Dr. PEDRO NOGUEIRA

Fortunately, posterity not experience such an abyss of pain that will give to our testimony the appearance of a fable. Thus wrote the Poet Petrarch in relation to the 1348 plague in Florence. Likewise, the guy adventurers who shared with Columbus the discovery of America had to look upon Yellow Fever in the same manner the Florentines did. That wonderful expedition was accompanied by a mysterious affection which chopped off lives indiscriminately, and turned the few who survived into human spectres. It appeared as if the grandeur and riches of the Great Khan were guarded and protected by a yellow monster, as a sort of divine punishment. Thus we know Yellow Fever, which over four centuries was to unloosen its terrible fury.

What can we say of its origin? Under the light of gathered data, the question of the pre-existence of the terrible endemia of America in past ages, perhaps hundreds of centuries before the Conquest, looms imperatively today. Nor can there be any doubt as to the fact that it was a permanent focus, radiating epidemic outbreaks to Europe over four centuries.

It cannot be admitted that it originated in Europe, as there is nothing to that effect inte the great works of Hippocrates, who was a witness to the warring conflagrations of his time, in which there possibly prevailed conditions similar to the contemporaneous ones.

The theory of doctors Audourd and Carter that it originated in Africa, is countered by the fact that in the 15th and 16th centuries the nationals of several European countries frequented the Western coasts of Africa, which are areas that show today a high index of endemia, and there are no records of a mortality similar to that suffered by Ovando, Hojeda, etc. If such a state of affairs had developed, it would not have been overlooked by the writers of those ages, nor by the Portuguese navigators, such as Bartolomé Díaz, Alburquerque and others. In 1879 Dr. Joseph Jones, of the University of Louisiana, published a paper in the "Proceeding of the Louisiana State Association", page 59, in which, after a critical examination of the works of Herodotus, Strabo, Cornelius, Justin, Virgil, Floro, Veleyo, Paterculo, Caesar, Horace, Cicero, Xenophon and Tacitus, states that he had not

been able to identify the illness in any of them. Moreover, he says that in the papers of the writers of the Middle Ages, Yellow Fever does not appear in anything until the discovery of America. Finally, the American origin of the disease is strengthened by the discovery of Jungle Yellow Fever in South America, and by the fact that there is no description of any important focus in Africa or in any other place.

ANCIENT TIMES

The study of the Mayan codices "Chumayel" and "Tizimin", made by the Bishop of Yucatan Crescencio Carrillo Ancora, proves beyond all doubt, —as pointed out by Finlay in his 1897 paper ''Conformity Between the Philology and the History of Yellow Fever",— that before the discovery there were epidemics of Yellow Fever, or of ''Black Vomit", in the coasts of Central America. As described by Carrillo, in folios 16 and 17 of the Tizimin Codex, handed down to us by the Indians of Tizimincah, there is a note the translation of which reports the fourth epidemic of black vomit in Yucatán in 1648, which coincides with what is described in the Chumayel Codex. The said writer points out that as there is no other report of the disease until the said year, and that as the mentioned Peninsula was not discovered until 1517, it must be acknowledged that the other three epidemics were suffered before the last date shown above.

The first accurate description of Yellow Fever seems to be the one made in the year 1495, after the battle known as Vega Real or Santo Cerro, fought by Columbus in Hispaniola against the Indians. After that the expeditions of Ovando, Nicueza, Hojeda et al, end in dreadful disasters. There can be no doubt that before the battle aforementioned, Yellow Fever exerted its lethal influence in the Antillas and in the Spanish Main under the names of **Modorra, Modorra Pestilencial** and **Fiebre Maligna Pútrida;** in México under the names of **Peste** and **Pestilencias, Matslahuatt** and **Cocolitzle;** in Yucatan under the name of **Xekik,** and among the Caribe under the name of **Poulicantina,**

Santo Domingo was scourged in 1495 and later in 1554, 1560, 1567, 1580, 1583 and 1588, the last named date coinciding with pirate Drake's expedition which was totally annihilated. According to the Spanish writers Hernández Morejón and Hurtado de Mendoza, Cádiz and Malaga were visited in 1507 and 1582.

17TH AND 18TH CENTURIES

In the year 1635 the Island of Guadaloupe was scourged and it caused the superb description of the epidemic made by Father Dutertré. There was a second attack in 1648 when the epidemic reached Yucatan.

The Island of Cuba, a land favored by nature, was the most beautiful possession of the Spanish Crown, as in the same there

are present all the necessary means which make for human happiness. Bathed by the Caribbean Sea, it sparkled in the distance as an emerald carved in a silver setting, and it served as a trading center to several world powers, thus being favored by great immigration currents. But, as if everywhere God wanted behind apparent happiness, he placed among the delights of this to remind man of his misfortunes, the cup of bitterness being paradise the exterminating disease of the Black Vomit. According to Pezuela, in the year 1649 our country "was pitilessly attacked by an unknown an horrible epidemic, imported from the American continent, one third of its population being devoured by a sort of a putrid fever''. From that date on the bonfire which the yellow flame kindled in the West-Indian Archipiélago, and the mass of new European visitors made the fire unextinguishable. In the years 1653, 1667 and 1668 Cuba is again attacked, and this condition lasted until Gorgas applied the principles of Finlay early in 1901.

Barbados suffered an attack in 1647 for he first time, and in 1695 Admiral Wheeler's fleet was destroyed before the same could attack Martinique. In 1697 Admiral Neville suffered a similar damage-

Santa Lucia was visited in 1664 where 1,411 soldiers were killed out of a garrison of 1,500 men. In 1690 Martinique suffered one of the most fatal epidemics, known as Oriflamme, this being the name of the ship which brought it. As the mentioned ship came from Siam, making a call in Brazil, the disease was named the "Siam Illness".

According to Roche Lima, the first appearance of Yellow Fever in South America took place in 1658, in Pernambuco; it appeared in New York in 1668; in Boston in 1691, in Philadelphia in 1669 and in Charleston in 1699. It cannot be doubted that by the end of the century Yellow Fever is the owner of the American soil, and that the outbreaks reproduced themselves each time a European expedition tried to penetrate into the West-Indian ring. Perhaps the Caribe played an important role in keeping this fire alive, by their numerous warring expeditions to the different islands.

But from the 18th century on, and due to the great military expeditions and to the facilities in the passenger routes, intensive Yellow Fever epidemics broke out. According to Griffith Hughe's "History of Barbados", the disease received its name because there it was called that. The English speaking countries adopted that name for it, while the Spanish speaking ones called it "Black Vomit", after the paper by the Spanish physician Juan José Castelbondo, a resident in Cartagena de Indias, which was published in 1729.

In that century Havana was brutally attacked several times, but we will only mention the 1762 epidemic, when the victorious army of the Earl of Albemarle saw his triunphant capture of Havana blurred by the havoc played in his ranks by Yellow Fever. Out of his 15,000 men only 7,000 came out alive. The Spanish regiments which arrived in Cuba in 1780, for the purpose of strengthening the forces of General Bernardo Galvez in Louisiana were swept away and the same happening to the fleet of General Aristizabal when it returned from Santo Domingo.

Admiral Graydon in Guadaloupe in 1703 and Admiral Vernon facing Cartagena in 1741, experienced the power of Yellow Fever. The latter, who had sailed from Southampton with 27,000 men to conquer Mexico and Peru, lost 20,000 men in his ill-fated enterprise. Gray's army in Martinique, and another one commanded by Abercrombie intended for the conquest of the other small islands, saw their ranks of 13,000 men disappear under the impact of Yellow Fever.

Santo Domingo was a permanent focus during the whole century, and there are times when Yellow Fever is so intense in the Greater and Lesser Antilles, that it is hard to say who is the infected and who the infector.

If we move to the African Continent we find record of an invasion in Senegal in 1740, and in Sierra Leona in 1764

First the cities of the British colonies in North America, and later on those of the United States, were attacked on several occasions, making life practically impossible in some of the ports in the Atlantic coast and in the Gulf of Mexico. New York underwent no less than 7 important epidemics from 1702 to 1800. Philadelphia was scourged on 11 occasions and we all know about the 1793 epidemic, perfectly described by Mathew Carey in his excellent exposition of the horrors suffered by the inhabitants of that City- In this morning I want to say a few words of remembrance of the 4,041 persons who died from August to November of that year, and do homage to our colleagues Hutchinson, Morris, Linn, Pennington, Dodds, Johnson, Glentworth, Phile, Graham and Green, who where the victims of Yellow Fever while fulfilling to their very last moments the sacred duties of our profession/—here in Philadelphia they wrote a page full of heroism and sacrifice.

Charleston was attacked 12 times and New Orleans suffered impacts on several occasions. The New York 1798 epidemics killed 2,300 persons; in New Orleans 4,044 human beings were lost, and Philadelphia was similarly shaked by the death of 3,446 of its citizens. But this scourge reached other cities, such as Baltimo, Mobile, Norfolk, leaving death and desolation in its path, its path.

In the 19th century we find the devastating epidemic which took hold among the men sent by Bonaparte to reconquer Santo Domingo. This expedition, 25,000 men strong, under the command of General Leclerc, was totally swept away by Black Vomit.

Cuba suffered the sternness of the disease by more than 25 outbreaks in the period extending from 1800 to 1887, and we may point out that the Spanish Government lost in the two Cuban wars more than 100,000 men. It may be stated that, unquestionably, Yellow Fever was the best ally of my country.

In this country the American cities along the Gulf of Mexico were the ones mainly shaken. New Orleans had epidemic outbreaks from 1800 to 1878, and in one year alone, in 1853, it lost 8,101 of its habitants out of a total of 29,020 patients, Mobile, Houston, Galveston, Pensacola, Key West, etc., were attacked. We will not mention the total number of visits suffered by New York, New Jersey, Boston, Savannah, Norfolk, where in 1855 Yellow Fever killed 2,000 persons. Charleston had 5 big outbreaks of which, the one in 1866 snatched 4,565 lives. In Memphis, Tennessee, scourged no less than 5 times, the epidemic killed 5,150 citizens in 1879 out of a total of 17,600 patients.

If we cast a rapid glance over the Old Continent, we find Madrid shaken in 1878, and the epidemics recorded in that century, in the cities of Cadiz, Cartagena, Jerez de la Frontera, Málaga and Barcelona, were really horrible, as in Cadiz alone, a city which had 57,000 inhabitants at the time, 48,000 cases of Yellow Fever were recorded, with 7,307 deaths. Jerez de la Frontera had more than 14,000 deaths and its population was practically desolated. In 1821 Barcelona lost 20,000 lives and Cartagena, in 1804, some 12,000 of its citizens. Trough the Canary Islands, it passed triumphantly on three occasions, leaving behing a wake of mourning and pain.

In 1856 Lisboa lost approximately 18,000 human beings, and thus Livorno, Brest, Marseille and Saint Nazaire were invaded- It reached Gibraltar and Southampton and finally, Dr. Graves left for us, a great description of the havoc it played in Dublin, in 1826.

In Africa the main epidemics took place in Senegal and Sierra Leone.

This rapid epidemiologic and historic outline of Yellow Fever brings us to the year of 1878, when the disease invaded more than 100 cities and villages in the United States, mainly in the States of Louisiana, Mississippi and Tennessee. The number of patients reached the figure of 120,000 out of which 20,000 were lost. Besides taking a terrible toll in human life, it caused the country the economic loss of $100,000,000 dollars.

In view of this enormous destruction, the Congress of the United States passed a law in March 1879, setting up the National Board of Sanitation, appropiating the amount of $50,000.00 for the same. The said amount was increased to $500,000.00 in July 2nd. The first resolution passed by the Board was to organize a Commission to visit the West Indies, with the object of studying Black Vomit in the supposed sources of the disease, with a three month stay in Havana, then to carry on its work in Rio and other endemic areas. This Commission which I call the FIRST AMERICAN COMMISSION FOR THE STUDY OF YELLOW FEVER, was formed by Doctors Stanford, E. Chaille, who presided over it, George Miller Stenberg, Secretary, Juan Guiteras, Engineer Mr. Thomas Hardee, and Messrs. Rudolph Matas and Henry Marcel. (We are fortunate to have in New Orleans that great figure Matas, who is the only survivor of that Commission).

The report of this Commission was rendered on November 16th, 1879, and among its conclusions the main one reads: "Yellow Fever is an epidemic transmissible disease and the agent capable of transmitting the disease must be in the air". This conclusion, plus the microscopic preparations he had obtained, led Dr. Carlos J. Finlay—who had participated in the works of the Commission,—to think of the possibility that the inoculating matter should be looked for in the blood vessels, and that from there it would pass by inoculation to the interior of a similar vessel, in the part receiving the infection- Thus Dr. Finlay moved along a new route, giving up his ideas in connection with atmospheric alkalinity, which he had studied up to then. All the foregoing, the "Nest Theory" held at the time by Bemis, Stone et al, as well as the study of the evolutionary cycle of certain fungi, strengthened him in his new belief, and thus he expressed himself in the International Sanitation Conference, held in Washington on February 18th, 1861, the three conditions which are necessary for the propagation of Yellow Fever, namely:

1. The existence of a previous case of Yellow Fever.
2. The presence of a subject capable of catching the disease.
3. The presence of an agent, independent from the disease as well as from the patient, but necessary for the transmission of same.

The eco is still alive of the revolutionary ideas contained in Dr. Finlay's paper titled "The Mosquito Hypothetically Considered as the Agent in the Transmission of Yellow Fever", read by him in the Academy of Medico-Physical and Natural Sciences of Havana, in its session of August 14th, 1881. In this paper the third Washington conclusion carries name and surname, as he further point to the Culex mosquito, known today as the Aedes Egypti.

How was it to be believed what seemed a heresy? How could Finlay present a thesis bringing in the intervention of a new element, the insects, in the transmission of the disease to a healthy person? Being ahead of his time, it is logical that he was not understood and that he would remain thus, over more than twenty years. Let us review, what was the status of Yellow Fever at the time, in order to understand the greatness of his work.

What was it that explained this rapidly changing manner of attack? We are not going to make a stop before the diversity of etiologic conceptions which were uttered, full of vagueness and lacking scientific basis, but which were the object of bitter disputes among its originators, although the said conceptions maintained everything concerning Yellow Fever in a deep mystery.

The work of Pasteur, opened a new field in the hypotesis of the etiology of Yellow Fever, and from that moment on, numerous germs and bacteria were involved, while the chimerical dreams of a number of researchers yielded to disciplined probationary work.

In view of the great diversity of bacteriologic opinions, the Plonorable President of the United States, Mr. Grover Cleveland Alexander, issued an order dated April 29th, 1887, appointing Dr. George M. Stenberg, U- S. Army Surgeon, to go to Rio and Mexico to study matters connected with the said diverse opinions. The findings of this work were read by Stenberg before the Medical Association of this Hospitable City of Philadelphia in April, 1888, and published in the Medical News of April 29th of the same year. He made evident that he had not found anything of interest in connection with his work on Yellow Fever.

While all the above went on, Dr. Finlay continued his tenacious work to prove his genial hypothesis, effectively assisted by the only man in Cuba who believed him, his inseparable companion Dr. Claudio Delgado, cncouraged in his irrevocable faith by his teacher Weir Mitchell, one of your own sons, and backed by Rudolph Matas in the beautiful city of New Orleans.

Upon his return to the United States, Dr. Stenberg, an untiring man, asked to be sent to Cuba to carry on his research. His request was granted by Special Order No. 93, of April 21st, 1888, issued by the Secretary of War, Mr. William C. Endicott. This is what I call the SECOND AMERICAN COMMISSION FOR THE STUDY OF YELLOW FEVER SENT TO CUBA. Due to its limited means and having to render a report to the President before June 20th, he returned to the United States, but this made it possible for him to go to Decatur, Alabama, to study everything connected with Yellow Fever in the South of the United States.

Set on discovering the enigma of the disease, he asked to be sent to Havana again, and his request is granted by Order No.

30, issued by the War Department in Washington on February 4th, 1889. By his tenacious and persevering work he was successful in eliminating many germs claimed to be the cause of Black Vomit.

There is no doubt that Stenberg was a real champion in this stage which he completely traversed. We saw him come to Cuba as the Secretary of the Chaille Commission, and in his eagerness to solve the riddle, he later on visited us on two occasions- But Stenberg was an experienced bacteriologist, as it is evident, and he followed the closed criterion of finding the solution in bacteriology, unheedful of Finlay, notwithstanding the fact that on many occasions he had discussed with him (Finlay) man's impotency to defeat the terrible disease. Possibly no one had greater opportunity of definitively solving the.-application of Finlay's principles than Sternberg. Moreover, he had the occasion, when he visited Mexico, of making the acquaintance of Dr. Daniel Ruiz in Veracruz, who in 1885 had inoculated blood of a Yellow Fever patient to a healthy person, to determine if thereby the infection could be transmitted. According to Stenberg's report: "At the time of my visit to Veracruz he expresed his entire willingness to repeat these experiments in my presence. This was exactly what I desired, and accordingly Dr. Ruiz made three inoculation experiments upon three unacclimated persons in the hospital."

Further down he reports the failure of the said inoculations and adds: "I was, therefore, anxious to make other experiments before leaving Vera Cruz but the time fixed by my orders expired without my having had an opportunity to do so.' Thus we see on that occasion that the time factor possibly prevented Stenberg from achieving what Welch was to recommend later on the Reed Commission.

What we have quoted above is contained in page 109 of the book by Martha Stenberg titled "George M. Stenberg. A Biography." A few lines before what I have transcribed there are the following words: "Dr. Finlay, of Havana, believes that the disease is commonly transmitted by mosquitoes, which, after filling themselves from a yellow fever patient, transmit the germ by inoculation into susceptible persons."

It is really unexplainable why Stenberg, a man of proved medical culture, did not follow the ideas of Finlay, specially when he had failed to make any progress as a result of his untiring hours devoted to the study of Yellow Fever. Further down, when we direct our atention to several interesting points in regard to the Reed Commission, we will see that he had the honor of appointing the same.

Let us mention that Dr. Guisseppe Sanarelli in 1887 published in the Annals of the Pasteur Institute, a paper claiming that the cause of Yellow Fever was the icteroid bacillus, discovered by

him. The publicity given to same was such that the Surgeon General of the United States Army, General Wyman, at the end of 1898 sent a commission to Cuba, made up by doctors Wasd- ing and Geddings, of the hospital service of the Navy, to verify the said claim. This is the commission which I call the THIRD AMERICAN COMMISSION FOR THE STUDY OF YELLOW FEVER IN CUBA- Wasding and Geddings published their conclusions in Washington, to the effect that they found the Sanarelli bacillus in thirteen patients out of the sixteen studied by them, thus maintaining in force the said chalatanry, prevalent at the time.

Stenberg, who had been promoted to the rank of Surgeon General, did not accept the ideas of Sanarelli, nor was he convinced by the conclusions of Wasding and Geddings, so he decided to send Dr. Aristides Agramonte to Cuba, whom he instructed and authorized to do everything possible to clear up totally the said question. In his paper entitled "RELATION OF THE ICTERIOD BACILLUS TO YELLOW FEVER", Dr. Agramonte proved that there was no connection between the two.

It will be noticed that at the end of the century the etiology of Yellow Fever is still an enigma except for Finlay, and we make an exception in his case because after he expounded in 1881 his doctrine of the transmission of the disease by mosquitoes he continued to work untiringly to prove to the world his scientific truth, studying in an exhaustive manner all the phases of it, namely, its etiology as well as bacteriology, epidemiology, clinical symptomatology, pathologic anatomy, prophilaxis, and describing minutely the anatomy of the Aedes Egypti, its habits and customs.

In the first period of Dr. Finlay's professional life connected with Yellow Fever, comprised between 1865 and 1881, he wrote ten papers on the subject, and from the last named date to his death, he publisred eighty works more related to the Black Vomit. His documents were written in several languages, English, French, German and Spanish, but mostly in English, and in them he shows his deep knowledge. We cannot mention here his complete works, but we believe it would be well to single off, in addition to the paper read by him on August 14th, 1881, in the Academy of Sciences, the paper he made known in that same place in two of its sessions, namely, those of January 31st and February 29th, 1884, titled "EXPERIMENTAL YELLOW FEVER COMPARED WITH THE NATURAL ONE IN ITS MORE BENIGN FORMS."

In the first part of this paper he starts by dealing with its in- cubational period, later on to discuss its diagnosis and benign cases in which albuminuria is present, and in those in which it is not. In the second part of his document he deals with Experimental Yellow Fever, inoculated by mosquito bites, setting down the manner in which to perform the inoculations. In it he master-

ly describes the first ones carried out on Spanish soldiers stationed at the Cabaña Fortress, as well as those performed on Jesuit Fathers in the "San José" farm, in Marianao, (where ii\ 1900 the Reed Commission was to establish the Lazear Camp), and in his conclusions Finlay says: "From the fact that Yellow Fever is inoculated by mosquito bites, there follows the need of protecting the patients attacked by that affection from the mentoned stings, in order to prevent the propagation of the disease." We find here, specifically pointed out, the fundamental principle in force today in the prophilaxis of Yellow Fever. In the part devoted to its diagnosis he deals with the called "acclimation fever", pointing out the ephemeral atacks of the disease which render immune those suffering the ailment, a Finlayan conception now identified under the denomination of "UNAPPARENT YELLOW FEVER." He also discusses the incomplete or abortive forms of Yellow Fever, in which the symptomatologic picture may be restricted to a feverish type characteristic of ordinary Yellow Fever, and its evolution within the limits pointed out, the other elements of the diagnosis being reduced to their slightest expression, or lacking completely.

In his paper read at the Convention of Hygiene and Demography, held in Budapest in September, 1894, he emphatically said the following: "to prevent Yellow Fever the following should be done:

"1—Prevent mosquitoes from biting patients of Yellow Fever.

" 2 —Exterminate as many contaminated mosquitoes as possible.

"3—To consider a place free from Yellow Fever, it must be kept in mind that mosquitoes fed on Yellow Fever patients may live from thirty-five to forty days under favorable conditions, therefore, prevention must last until that period has elapsed, as a contaminated mosquito is infectious during its life time-"

Please consider the value of these postulates under the light of our present knowledge, and to what an extent that misunderstood man, who found no respect for his scientific truth, was a prophet.

In his memorable paper titled "REVIEW OF THE PROGRESS ACHIEVED IN THE 19TH CENTURY IN THE STUDY OF THE PROPAGATION OF YELLOW FEVER", published in 1901, he gathers, with the help of his great companion, Dr. Claudio Delgado, the data on all experimental inoculations practiced thus far, which is a wonderful exposition of his tenacity and faith in his convictions. It may be argued that the said papers were not completely conclusive, but there can be no doubt that he established the firm basis of a new doctrine, which would make possible the ful] confirmation of his ideas later on. It is my

opinion that if his guiding lines to put an end to Yellow Fever had been followed, the disease would have been conquered years before, thus saving thousands of human lives.

Before bringing to an end this part of our paper relating to Finlay, it must be mentioned that Yellow Fever was not his only concern, as he worked on cholera, filariasis, goiter, tetanus, opth- thalmology, cancer, leprosy, tuberculosis, trichinosis, beriberi, glanders, etc., publishing more than fifty papers on subjects concerning public health other than Yellow Fever.

I do not want to tarry on the subject of the different opinions held in connection with insects prior to Finlay's relative to mosquitoes, or on the ones which were formulated after that, as the majority of them deserves no special attention. We will limit ourselves to a mention of Nott and Beauphertuy using therefor the words expressed in Dr. H. R. Carter's book "THE PRACTICE OF MEDICINE IN THE TROPICS", reading: "Neither Beauphertuy nor Nott, in spite of the ingenuity of the theories expounded by them, may be considered as predecessors to Finlay regarding the theory of the transmission of Yellow Fever by mosquitoes."

However, I may add that in the Convention of the History of Medicine, recently held in Rome, Italy, this problem was definitely settled.

While Finlay was carrying out all that has been reviewed above, the drama of Cuba went on unfolding itself, was everlastingly present in its horizon, and yet no one paid any attention to him, —he was still the object of mockery. This gloomy panorama led General Stenberg to appoint the Reed Commission, or the FOURTH AMERICAN COMMISSION FOR THE STUDY OF YELLOW FEVER. Thus there arises Special Order No. 22, of the Headquarters of the Navy in Washington, dated May 24th, 1900. In the new Order we find new proofs of Stenberg's non- acceptance of Finlay's principles, as in the book "MEMOIRS OF WALTER REED", by General Albert Truby, who lived the whole Cuban episode of 1900, the following is stated in pages 89 and 90: "Having for years given thought to this subject, I became some time since impressed with the view that in Yellow Fever, as in Malarial Fevers, there is an "INTERMEDIATE HOST". I therefore suggested to Dr- Reed, President of the Board, appointed upon my recommendation for the study of this disease to the Island of Cuba, that he should give special attention to the possibility of transmission by some insects, although the experiments of Finlay seemed to show that the insect was not a mosquito of the genus Culex, such as he had used in his inoculation experiments. I also urged that efforts should be made to ascertain definitely whether the disease can be communicated from man to man by blood inoculations." This was wrote by Stenberg in his paper titled "THE TRANSMISSION OF YELLOW FEVER BY

Old Painting by Esteban Valderrama, culminating figure of Cuban plastic arts, symbolizing the instant in which Dr. Finlay handledd to the American Medical- Military Commission the mosquitoe's eggs. This Commission was presided by Dr. Reed who officially confirmed Finlay's findings. This painting was placed at the Presidential Palace by initiatice of the President of Cuba, General Fulgencio

Batista y Zaldivar,

MOSQUITOES", in "Popular Science Monthly" in July 1901. Ten years before, in "The American Journal of Medical Science", No. 102, year 1891, Stenberg wrote a paper titled "DR. FINLAY MOSQUITO INOCULATIONS", in which he stated that such works were unworthy of consideration, which brought above Dr. Finlay's rejoinder sent to the Editor of the Journal at the time, Dr. E. F. Davis, who was later to be the brilliant professor of obstetrics in the Jefferson Medical College.

The Reed Commission started its work by conclusively eliminating the importance of the Sanarelli Bacillus. The four members of the same, Reed, Carroll, Lazear and Agramonte promptly swept away that charlatanry. It is evident that in view of the negative results of this research, the Commission was going to engage itself in the bacteriologic study of the intestinal flora of patients of Yellow Fever and of healthy persons, but the guiding hand of General Wood, the findings of Dr. Ross in regard to malaria, and the observations of Carter on the incident of Yellow Fever in connection with the extrinsic period, perhaps all the above happily led the Commission to follow Finlay's path.

Thus the Reed Commission started its studies receiving from Dr. Finlay all the data which, according to his opinion, was of interest. Reed was forced to abandon his work in Cuba called to the United States to report on an Army typhoid fever epidemic outbreak in the South, and left Cuba on August 2nd, 1900. His departure brought about the following distribution of the remaining members of the Commission: Lazear was to work on the breeding and feeding of mosquitoes; Carroll on bacteriologic studies and Agramonte in Hospital No. 1. In the Board meeting of August 1st held in Havana and presided by Reed just before his departure, it is evident that Lazaer was the only member of the same who was enthusiastic over the mosquito theory- To prove this last statement we quote part of a letter Lazear wrote to his wife, dated August 23rd, contained in Hench's "DR. JESSE LAZEAR AND HIS CONTRIBUTION TO THE CONQUEST OF YELLOW FEVER": "Reed and Carroll have been at their bacteriologic work for a long time...They are interested in the controversy with Sanarelli. I would rather try to find the germ without bothering about Sanarelli. The malarial work is my own ."

Undoubtedly the plan of the Commission comprised experiments with human beings, so Lazear betwen August 11 and 25 applied infected mosquitoes to nine American soldiers, includig himself and Drs. Carroll and Pinto. These experiments failed because the infected mosquitoes were not yet "ripe" enough. In August 27, Lazear inoculated Dr. Carroll who promptly developed yellow fever. On September 6 Private Dean developed the disease after inoculation also. Two days after Lazear wrote his wife (Sept. 8) the following: "I rather think I am on the track to the real germ, but nothing must be said as yet."

Shortly thereafter a lamentable happening takes place: La- zear, infected by what appears to be an experimental sting, dies victim of the disease on September 25th, thus ending a life full of promise, the life of the man who, with masterly hands, guided the definite experiments to confirm what Finlay had said. From that moment another name, that of JESSE LAZEAR, was offered as a sacrifice to save thousands of lives, and under the blue sky of our country the light of his reasonnig was clouded in his brain, and from our land there flew his last thoughts to his wife and daughters, and to his future boy who was to bear the honor- giving name of Lazear.

Shortly after this loss, on October 3rd, Reed returned to Cuba and immediately thereafter, with the data tenaciously wrought by Lazear, he presented at the meeting of the American Public Health Association, held in Indianapolis on October 23rd the paper ' ETIOLOGY OF YELLOW FEVER. A PRELIMINARY NOTE", in which he calls the attention of the scientific world that what had been held by Finlay since the year 1881 was a great truth.

Walter Reed returns to Cuba in the first days of November and together with General Leonard Wood, planned the construction of a Camp in which to carry out the experiments which Lazear had already orientated, in order to conclusively prove the mosquito theory- He selected as its location the "San Jose" farm, in Marianao, where in 1883 Finlay had performed experimental inoculations upon Jesuit Fathers. We are of the opinion that Reed selected that place following Agramonte's suggestion, who knew that in spite of the Yellow Fever epidemics in Marianao, there were no cases of the disease in the said form surely because the Aedes Egypti were not present in it. The Camp was named after Lazear, in honor of the disappeared hero.

Two cabins of identical measurements were built, and in one of them, bearing the No. 2, experiments with infected mosquitoes were made on volunteers, while in the other, bearing the No. 1, it was proved that the FOMITES had nothing to do with the transmission of the disease.

This group of volunteers,—made up of Americans, Spaniards and Irishmen,—showed to the world its greatness and courage in experiments carried out in a disciplined manner, and with sufficient resources, which indorsed the greatest scientific truth, a truth our glorious Carlos J. Finlay had offered and the medical world had refused to accept.

That spot of Cuban land which Hench correctly identified as Cabin No. 1 with the help of Moran, one of the great volunteers, was still kept as a symbol of that great event in 1940 when it was declared by the Cuban Government a National Monument. This was not possible in regard to Cabin No. 2 which was destroyed by

the cyclone which attacked Havana in 1926. Cabin No. 1 was restored to its original status in 1900, and a park has been constructed around it in which bronze medallions on Finlay, Wood, Lazear, Reed, Agramonte, Carroll and Delgado were placed, with two bronze plates bearing the names of all those who volunteered and of the persons who contributed to the definite Conquest of Yellow Fever.

Shortly after the holding in Havana in 1901 of the Third Pan- American Medical Congress, Reed presented the conclusions of the Commission, which permitted Gorgas (another unbeliever of the Finlay theory) to carry out the great work of making Havana wholesome which started on the 4th of February, 1901. We may call this the first work of high point in Public Health, irrefutably demonstrating its result. Thus, in February 5 deaths were recorded in Havana, one in March, none in April, May and June, one in July, two in August and two in September. What had been the brutal and ferocious scourge of its inhabitants over four centuries, finally disappeared. Undoubtedly the definitive conquest of Yellow Fever by itself justifies the Spanish American War, in spite of the fact that in the period comprised between 1898 and 1900 the United States suffered 231 deaths of Yellow Fever out of a total of 1,775 cases.

After his success in Havana, Gorgas, supported by the Governor of the Isthmus of Panama, General G. W. Davis, made possible the construction of the Canal which Lesseps was not able to build years before. To accomplish this he simply had to put into practice a campaign against the Aedes Egypti, which was the key of his great success.—There can be no doubt that the disappearance of Yellow Fever in Panamá, and his victorious campaign against Malaria, are elocuent facts revealing Gorga's scientific, sanitarian, diplomatic and moral qualities, as well as his organizing and executive abilities, which place him on the level of the first world's sanitarian.

Now, let my final words to express, our joy and profound happiness to the Jefferson Medical College, for taking the iniciative in honoring Dr. Carlos Finlay on the Centennial of his graduation.

Like a lovely mother, this honorable Institution molded the majestic figure of Dr. Finlay and today, I feel and all of you, must sense his gigantic figure being projected all around us.—To you, Jefferson Medical College, the esteem of my country and our profession must be shown for honoring one, who loved and honored you during all his professional life and for maintaining after 100 years a faith and confidence in his greatness as did his teacher Dr. Weir Mitchell while Finlay struggled to prove to a doubting world his great scientific truth.

Thanks yours.