At the autopsy on the little cadaver, I found the characteristic lesions of yellow fever, shown with sufficient clearness to establish the identity of the disease, notwithstanding the difference in the organisms.

These direct inoculation experiments were repeated a great many times, the same results were produced in nine cases out of ten. The cadaveric lesions were always the same.

Examinations of blood taken from the ears of a guinea pig suffering from the disease invariably gave the same results, *i.e.*, the recognition or presence of the same microbe met with in man suffering from specific yellow fever.

Having thus established that yellow fever was transferable by inoculation, or vaccination from man to the guinea pig, it became easier to study the *rôle* of the microbe itself in the production of the disease.

More animals were inoculated with the culture liquids peopled with the microbes. They all died in the same manner, presenting the same symptoms as those infected by the direct inoculation of blood.

The periods of incubation in the various experiments declared themselves with varying phases in from one to nineteen days. Figures that correspond with those resulting from observation of the disease at Panama.

As a whole, the knowledge acquired by the experiments just related may be summarized thus :

1st. Yellow fever is a disease that is always characterized by the presence in the blood of the patients of a special microbe, which can be multiplied outside of the bodies of men or animals, by artificial culture.

2nd. The microbes give birth to germs endowed with great resistance to destructive causes, and are capable of reproducing the disease.

3rd. Yellow fever can be transmitted to a guinea pig by the inoculation of blood in its sub-cellular tissues.

4th. Finally, the animals inoculated with cultures charged with the parasites, contract yellow fever and die. Post-mortem, the same lesions are found as in those directly inoculated with blood.

II.

Vaccination.

"In 1880 M. Pasteur discovered the first in-"stance of a disease, produced by a special mi-"crobe, which, by special treatment, could be de-"prived of a part of its virulence, and that fowls "could be inoculated with it, without danger. By "using the attenuated virus, the disease could be "communicated to fowls, and after a light attack "they were protected against the fatal disease.

"Later, several microbic diseases were recog "nized or defined. Their microbes having the "same properties.

"M. Pasteur, with marvelous sagacity, could not "help but remark that the process which had ena-"bled him to lessen or attenuate the action of the "microbe of chicken cholera, ought to be a pro-"cess of diminishing or attenuating the virulence "of microbes generally that cause other diseases."*

Such were the antecedents that encouraged one to search out a method for attenuating the microbe of yellow fever. In my experiments already related I noticed that three of the inoculated animals that were dangerously ill recovered. That circumstance permitted me to submit to experimental proof, the important theoretical problem, as to whether they were still susceptible to the yellow fever poison. The three guinea pigs were re-inoculated some time afterwards to demonstrate if they were susceptible to the disease *de novo*. They did not present any abnormal symptoms after the inoculation, nor the slightest elevation of temperature.

Thus, we should admit in principle that yellow fever cannot be taken anew. And in this again the experiments were in perfect accord with clinical observations.

This fact accepted rendered my later experiments perfectly legitimate in the alternation of the virus of yellow fever poison for the production of a vaccine-virus capable of protecting man against the terrible effects of the disease.

The problem, thus stated, to me seemed susceptible of receiving a favorable solution by following in the steps traced out with so much perfection by M. Pasteur, in his search for the virus of charbon or malignant pustule.

This *savant* showed that he easily could obtain microbes of various degrees of virulence. From the deadly virulence, that is to say, that killed one hundred times in a hundred the animals experimented upon, such as guinea pigs, rabbits and sheep, passing thence by a number of intermediate steps down to the most inoffensive attenuation of the virus. The method of preparing this atten-

* Chamberland de la Vacination Charbonneuse.