some of the bacteria-culture fluid was injected under the skin of the abdomen of a male pig five months old. At the end of the month of May they observed on the abdomen seven or eight elevated pustules, which augmented in number during the following days. On the 4th of June the animal was attacked with conjunctivitis of the left eye, and had also a tumor on the penis." On the 21st of June another male pig was inoculated by them with the secretion of a syphilitic chancre, and *in the following days* (italics my own) an eruption similar to that of the first was seen. On the 2d of July, with *the bacteria found in the blood of the second pig*, they injected under the skin of the region of the penis of a third hog, and a goat, which animals have shown no morbid symptoms. The blood of these animals, and also that of a monkey thus operated upon, was examined by Professor Nochard, and was found free from bacteria. Martineau, in another communication, claims that he inoculated a monkey successfully with syphilis. Perhaps I can do no better than quote in full Koch's criticism on these experiments as contained in his recent reply to Pasteur as to the faultiness of the latter's method of culture of micro-organisms in general, since it is to the point. Koch says: "This syphilis of the pigs recently described by Martineau and Harmonic, and which manifests itself by the appearance of a bacillus in the blood within twenty-four hours after the inoculation, belongs to the domain of things which are in formal contradiction to all the experiments and dominant ideas of science, and whose only value is to shake the confidence which is little by little beginning to be bestowed on etiological researches. It is to be hoped for the future of this branch of science, that errors of this nature be consigned to oblivion."

Gibier,[1] in a critical review, takes exception to the harsh brevity of the Teuton, thinks that the observations of Martineau and Harmonic, if not conclusive, have a certain value, and promises that a further and convincing experiment of Martineau will soon be published. It may be interesting to note that both Rebatel and Neumann have failed to inoculate animals after the most conscientious efforts thereto.

The gist of this whole matter is this: That with the secretion of a hard chancre which has been irritated naturally or artificially, chancroids may be produced in animals, and that with the unirritated secretion or with portions of the chancre we may produce something, perhaps syphilis and perhaps tuberculosis. The question may yet be settled by unprejudiced and enlightened syphilographers, who may or may not need the aid of experienced and dexterous mycologists.

In the year 1872, Lostorfer[2] startled the whole medical world with the announcement that he had discovered, by means of the

[1] Annales de Dermat. et de Syphiligraphie, Feb. 1883, tom. 4, No. 2.
[2] Ueber die Specifische Unterscheidbarkheit des Blutes Syphilitischer. Arch. für Dermatologie und Syphilis. Jahr 4, 1872. Page 115.

microscope, in the blood of syphilitics, peculiar bodies which he claimed were only to be found in the subjects of syphilis. For a time our hopes were great that the long-sought essence of the disease had at last been found, but when by the observation of many other competent microscopists these bodies were proved to be derived from the white corpuscles, and were to be found in the blood in many other diseases, Lostorfer's corpuscles were consigned to the oblivion to which they rightly belonged. Notwithstanding this cruel disappointment the search goes steadily on, and though as yet there is nothing definitely settled as to the exact *materies morbi*, we have our hopes and many interesting observations and experiments by careful observers. I will only give the general results of these observations, referring the reader to the various interesting papers from which I quote for a more extended knowledge. In the year 1880, Pisarewski[1] called attention to the fact that until then the microscopic observations upon hard chancres had been only in the direction of their pathological arrangements, and he gave a description of certain bodies which he found in four hard chancres, two of which had been excised from three to six days after their appearance, and two others which still existed after the evolution of secondary lesions. Pisarewski found in the induration a granular material both scattered and aggregated, and held together by a transparent homogeneous basement substance. This granular material, which seems to consist of round uniform nuclei, he thinks must be regarded as groups of lower organisms in the form of zoöglœa. They were found chiefly in the lumen of the lymphatic vessels. The view that they were micro-organisms was confirmed by the action of reagents and of coloring materials. Pisarewski did not find the rod-shaped helico-monads found by Klebs. He thinks that these organisms are the developmental stages of the micro-organisms of syphilis. Klebs's experiments in the inoculation of animals with syphilis have already been given. It remains to be said that he also found schizomyetæ (micrococci and bacteria) in the culture fluid of non-ulcerated hard chancre. He calls these organisms helico-monads, and thinks that they are the *materies morbi* of syphilis. In the same year 1880, Dr. I. Bermann,[2] of Baltimore, published the results of his investigations, which seem to have been undertaken without the knowledge of the work of others. He found in an indurated chancre a singular collection of micrococci and fungoid growths firmly adhering to and partly filling up the lumina of most of the lymphatic vessels. These growths, which were also found in some of the arteries, were so firmly fixed as to withstand active manipulation of the sections. Bermann says that the principal changes were observed in the lymphatics, at some distance from the initial lesion, and thinks that this fact may account for the failure of some observers to

[1] Die niederen Organismen des Harten Schankers. Wratsch, Nos. 18 and 19, 1880. Centralblatt für Chirurgie, No. 32, 1880.
[2] The Fungus of Syphilis. Archives of Medicine, Dec., 1880.

find them. The theory of syphilitic infection, according to this observer, is as follows:

"The infection takes place by reason of a few germs or micrococci being retained in a lesion of the skin. They are taken up by the lymphatics, and here they increase and multiply, spreading principally in them, and soon begin to obstruct the circulation in them. The consequence is an infiltration of the tissue surrounding them, and thus the induration is produced. In course of time they develop more and more; small particles of them get into the circulation of the blood, and are carried into the different parts of the body. They take root at those points where the conditions are most favorable for their growth, and cause there eventually the same changes as before described."

Aufrecht[1] thinks that he has found in condylomata lata a micrococcus peculiar to it. This consists of large cells in the form of diplococci or two united, and the number of them is greater than that of the micrococci. They are somewhat less frequently found in the form of three rods. These bodies are deeply stained by fuchsine. In six patients having condylomata, he found these bodies fully developed. Aufrecht advises that only unulcerated lesions and those not treated (particularly with mercurials) should be used. Leistikow,[2] in his observations, was unable to find micro-organism, either in the clear serum of incised condylomata or in the blood of syphilitics, when all sources of error had been avoided. On the surface of eroded indurations, however, and on ulcerated broad condyloma, provided that the secretion was slight and not fetid, he found the micro-organisms of Aufrecht. In the fetid secretions shorter and longer rods or spirochatæ were found which resembled those of other ulcerations which had been exposed to the air. In short, this observer did not find any micrococci which he considered peculiar to syphilis. In soft chancres bacteria in large quantities and of various forms were found, also masses of zoöglœa, of the finest micrococci, and the large forms both single, in pairs and in rods, and spirochatæ were discovered in fetid secretions. Leistikow also concludes that the microscopic appearances furnished nothing conclusive as to the pathogeny of soft chancres.

Dr. R. B. Morison,[3] of Baltimore, while pursuing his studies, in Vienna, under the auspices of Neumann and Zeissl, found a bacterium in hard chancres, ulcerating papules, and in syphilitic blood, which he then regarded as peculiar to the disease. Later[4] observations, made at Prague, under the supervision of Chiari and Pick, convinced him that his conclusions had been false, for, he says, "I

[1] Ueber den Befund von Syphilis Mikrokkoken. Centralblatt für Med. Wissen., No. 13, 1881.
[2] Ueber Bacterien bei den Venerischen Krankheiten. Charité-Annalen, vii. Jahrgang, 1882.
[3] Maryland Med. Journal, Jan. 1, 1883.
[4] Ibid., May 5, 1883.

am forced to deny the pathogenetic nature of these micro-organisms, and I am convinced that their presence is due to external influences." While he found micro-organisms in ulcerating lesions of syphilis, he also found the same in open lesions of eczema, impetigo, acne, and prurigo. In Vienna he had used the unopened lesions. Similarly, in ulcerating syphilitic lesions he found bacteria, in non-ulcerating he was unable to find them, and in the blood from non-ulcerating lesions he also failed. He concludes that the organisms are not bacteria but diplococci. Finally, he is convinced that these organisms are not developed in the syphilitic lesions, but that they are of extraneous origin. Morison also found micro-organisms in the secretions of soft chancres. It has been reserved for Birch-Hirschfeld[1] to push these investigations further than previous observers, and this accomplished microscopist has found bacteria in every observed instance of gumma, including one from the lung of a case of congenital syphilis. The largest number of bacteria was found in the periphery of the granulation tissue close to the zone undergoing degeneration. In the firm, fibrous portion of syphiloma they were almost absent, and in cicatrices of gummy indurations they were always absent. These bacteria, which lay free in the tissues, were always closely packed in the form of small colonies, but they were also seen inside the cells, even filling them up, and in other instances only at the periphery of the cell. He also found these bodies in the broad condylomata, in one indurated chancre, and in a syphilitic papule, but failed to find them in the blood of a syphilitic whose roseola had appeared two days previously. It is interesting to note that this observer found larger forms of micrococci in flat condylomata and small, even minute forms, in gummatous infiltrations of the viscera. In fresh gummata they were most numerous in those portions which had the character of proliferating granulation tissue. The nuclei of the epitheloid cells of gummata and of condylomata were filled with fine elongated cocci, which could be deeply colored with fuchsine, and were not destroyed by prolonged immersion in a potash solution. Generally the organisms were found in the more centrally located cheesy portions of the gumma. Birch-Hirschfeld thinks that these micro-organisms may be the carriers of syphilitic contagion.

This being in a general way the condition of the subject it is interesting to know that Neisser,[2] who has studied it very extensively, comes out boldly as a believer in the bacterian theory of the origin of syphilis. This observer says: "In spite of all the existing uncertainty we yet hold that the opinion that syphilis is a disease due to bacteria is fully justified, and will make the attempt to explain the

[1] Ueber Mikro-organismen in syphilitischen Neubildungen. Centralblatt für Med. Wissensch., 33 and 44, 1882.
[2] Handbuch der Hautkrankheiten (Ziemssen), Erste Hälfte, 1883. Leipzig. Neisser contributes the section on Chronic Infection Diseases of the Skin, which includes Syphilis.

relations of the course of the disease, the infection, the heredity, etc., from this standpoint. Of course when we go into the details of the pathological processes to demonstrate the specific changes in the cells and tissues, the varieties of their growth, their viability, their death, the changing reactions upon chemical processes, etc., in a satisfactory manner, as all can do so readily with the bacillus of leprosy, we miss the possibility of demonstrating at every step the constant presence of the bacteria, and for the solution of such detailed questions we are almost completely confined to analogy."

CHAPTER III.

THE INITIAL LESION OF SYPHILIS, OR CHANCRE.

Logical accuracy as well as simplicity and perspicuity of language require the abandonment of the terms "hard," "indurated," and "infecting chancre," as applied to the initial lesion of syphilis, which should be simply called by the name of *chancre, syphilitic chancre, initial lesion of syphilis*, or *primary syphilitic ulcer*. If the name "Hunterian chancre" be retained, it should be applied exclusively to the less frequent form of chancre which Hunter designated, and which is characterized, in addition to the induration common to all forms of chancre, by a degree of ulceration that involves the whole thickness of the skin or mucous membrane. The term "infecting chancre" is really not objectionable as some think, since there is reason to believe that it is for a time the local expression of syphilitic contagion. Diday quaintly remarks, when a man contracts syphilis, the chancre that can properly be called infecting is the one upon the woman who gave him the disease.

For a comparison of the frequency of the initial lesion of syphilis with that of the chancroid, the reader is referred to the first chapter of the second part of this work, where the remarks upon the seat of the chancroid are also applicable in the main to the sore under consideration. The following table exhibits the seat of 471 chancres in men, comprising all that were observed at the Hôpital du Midi in the year 1856:

Chancres	on the glans and prepuce,	314
"	on the skin of the penis,	60
"	on various parts of the penis,	11
"	involving the meatus,	32
"	within the urethra (not visible on forced separation of the lips of the meatus, but recognized by palpation, inflammation of the lymphatics, etc.),	17
"	on the scrotum and peno-scrotal angle,	11
"	of the anus,	6
"	of the lips,	12
"	of the tongue,	8
"	of the nose,	1
"	of the pituitary membrane,	1
"	of the eyelid,	1
"	of the fingers,	1
"	of the leg,	1
	Total,	471

In 130 women affected with true chancres at the Antiquaille Hospital, Lyons, where wet-nurses are admitted, M. Carrier found the seat to be: