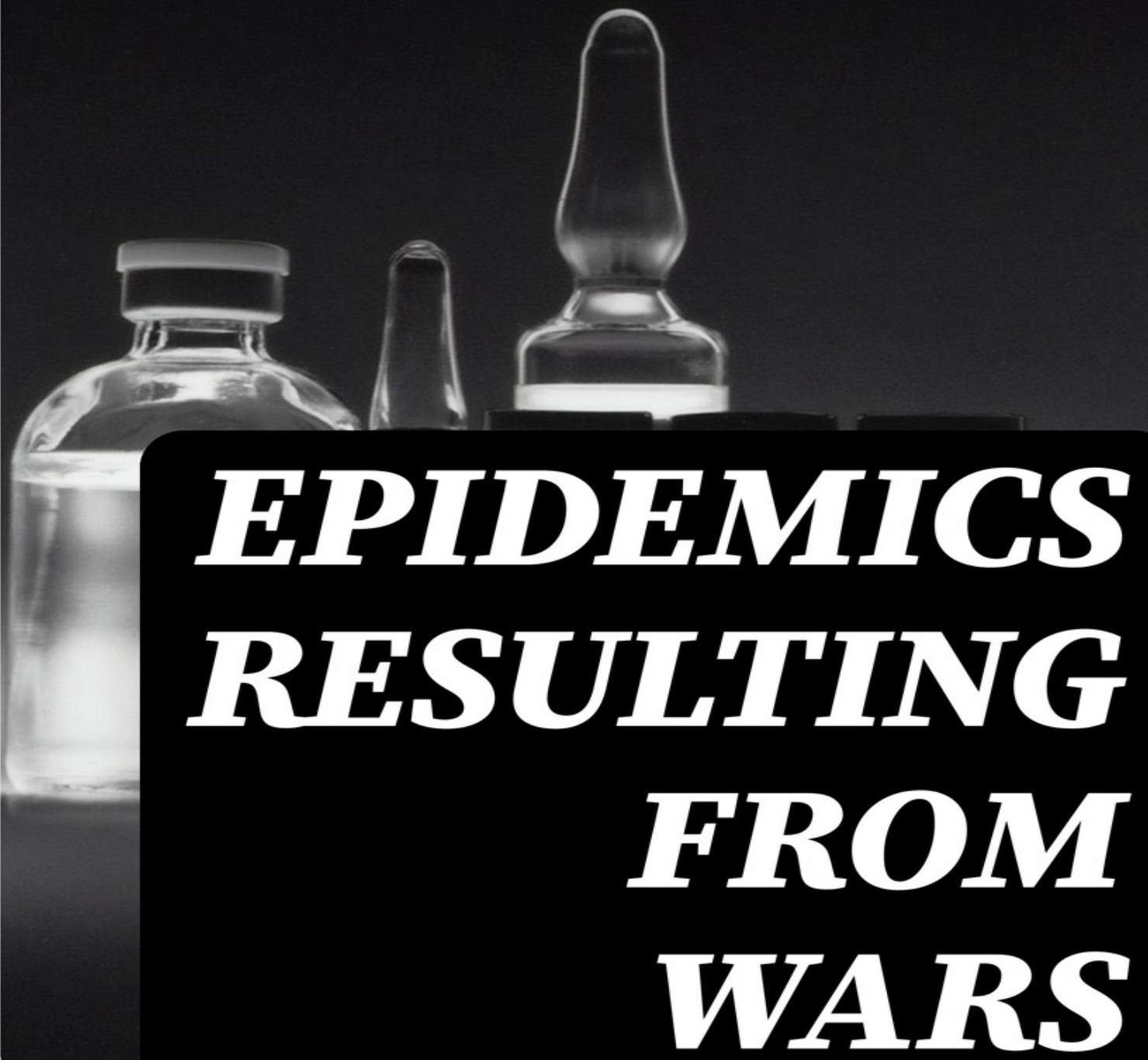


**FRIEDRICH  
PRINZING**



**EPIDEMICS  
RESULTING  
FROM  
WARS**

**Friedrich Prinzing**

# **Epidemics Resulting from Wars**

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# INTRODUCTION

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In countries which have the misfortune to be the scene of protracted wars, the mortality regularly undergoes a considerable increase. This is caused chiefly by the infectious diseases which in war times so often appear in the form of epidemics. These diseases, moreover, not only afflict the country in which the war is waged, but are also carried by prisoners, returning soldiers, and in other ways, into the land of the victor, where it is possible for them to spread over a large territory. A report on the loss of human life among that part of a population which does not participate in a war has not yet been undertaken, writings on war pestilences usually confining themselves to the losses within the armies themselves.<sup>[1]</sup> It is the purpose of the present study to investigate the losses sustained by the non-belligerent part of the population in consequence of epidemics caused by wars.

In doing this it seems advisable to select a few war pestilences which on account of their enormous extent are particularly notable, and to subject them to an exhaustive discussion. This method has the advantage that it will enable us to show in individual cases how it is possible for these pestilences to extend over such a vast territory, under what circumstances they spread from place to place, and how they enter regions remote from the scene of war. For this exhaustive discussion the writer has chosen the pestilences that occurred during the Thirty Years' War, the epidemic of typhus fever after Napoleon's Russian

Campaign, and the pandemic of small-pox after the Franco-German War of 1870-1. These epidemics afford very instructive examples of what horrible losses both friends and enemies may sustain in consequence of war pestilences.

While the outbreaks of 'plague' in the course of the Thirty Years' War have already been made the subject of a comprehensive account, strange to say there are no such accounts of the other two epidemics; to give a clear picture of these pestilences the writer was therefore constrained to collect the necessary information from widely dispersed sources. In gathering his material a number of large German libraries assisted him most kindly—particularly, the Royal National Library at Stuttgart and the University libraries of Strassburg and Tübingen.

The other parts of the history of war pestilences are set forth in a more general way; for an exhaustive treatment of them would have necessitated several years of preliminary work, which the writer in the short time at his disposal was unable to undertake.

The writer has drawn as much as possible from original sources; this applies at least to the pestilences of the Napoleonic Period, and to the epidemic of small-pox after the Franco-German War. It would have been impossible to deal with the other wars in the same way without consuming considerable time. From the bibliographies it will appear what sources the author has consulted; rarely are quotations given from works which he has not seen, and in such cases it is indicated whence they were taken.

The causes of the origin and spread of pestilences during a war are clear. Every aggregation of people, even in times of peace, at celebrations and annual fairs, in barracks, and so forth, is necessarily exposed to the danger of pestilence; but this danger is ten times as great in large assemblages of troops during a war. The soldiers are then subjected to all possible kinds of hardship and suffering—lack of food, or food which is inferior and badly cooked, sleeping out in the cold and rain, fatiguing marches, constant excitement, and homesickness—and all these things greatly lessen their power of resistance. When large bodies of troops are obliged to remain in one and the same place for a considerable length of time, the additional difficulty presents itself of keeping the locality unpolluted by the excrement of men and animals, and by refuse of all kinds. If an infectious disease reveals its presence in such an aggregation of people, energetic and stringent measures must be adopted, even in times of peace, to prevent it from spreading. In war times it is often impossible to take the necessary precautions, since the attention of the commanders is directed toward very definite objects, to which all other considerations are subordinate. Whether the germ of the disease is already in the place, or whether the soldiers bring it with them, in either case there is danger that the fighting armies will cause the disease to spread over the entire scene of the war, and thus seriously endanger thousands of human lives.

Modern methods of sanitation have done much toward preventing the spread of army pestilences, not only in peace, but also in war. The last few decades have evinced

that fact. Whatever attitude we may assume toward the question whether war can ever be wholly abolished, we must all agree that, if war has once broken out, all possible means must be employed to prevent the spreading of pestilence within the armies. Here the interests of the people and of the commanders coincide, since the efficiency of armies is often seriously interfered with by the outbreak of pestilence, and not infrequently the success or failure of a war depends, not upon the outcome of its battles, but upon the appearance or non-appearance of pestilence.

# CHAPTER I

## WAR PESTILENCES

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All infectious diseases may spread in consequence of war and develop into epidemics of varying extent. In the next chapter we shall see how the wars at the end of the fifteenth century favoured the spread of an epidemic of syphilis. In the Union Army, during the American Civil War of 1861-5, both measles and typhoid fever were very widespread, and together they were the cause of 4,246 deaths, or about 1·75 per cent of the total enlistment. Scarlet fever, influenza, yellow fever, relapsing fever, and malaria (if the war is waged in countries where this disease is endemic—especially in the Lower Danube region, in the Netherlands, Spain, and Italy) have also played an important rôle in many wars. But we give the name 'war pestilences' only to those infectious diseases which in the course of centuries have usually followed at the heels of belligerent armies, such as typhus fever, bubonic plague, cholera, typhoid fever, dysentery, and small-pox; we may also include here scurvy, the etiology of which has not yet been definitely determined.

1. *Typhus fever* (spotted fever, exanthematic typhus—called in France and England simply typhus, in Spain tabardillo<sup>[2]</sup>—formerly called contagious typhus, hunger typhus, camp fever, and Hungarian fever) is an acute infectious disease of cyclic recurrence, which resembles typhoid fever only in name. From the eighth to the tenth day after infection, often somewhat sooner or later, it begins

with a chill, accompanied by nausea, vomiting, violent headache, and psychic depression. In the first few days the patient's temperature rises rapidly, and on the fourth or fifth day a rash in the form of dull-red spots, as large as a pea, breaks out over the entire body. These spots gradually grow larger, and after two or three days, through the appearance of very small haemorrhages, change into petechiae. The apathy of which the patient first gave evidence now gives way to wild delirium. At the end of the second week the temperature falls rapidly, and in one or two days becomes normal; often, however, the fall of temperature takes from six to eight days. The duration of the entire disease, accordingly, is from two to two and a half weeks. Death usually occurs at the crisis of the disease—from the tenth to the twelfth day—rarely between the sixth and ninth days or after the twelfth.

The danger of the disease varies greatly in different epidemics; statements regarding this point diverge according as we refer to the statistical records of hospitals or to the private practice of physicians. With the latter the number of deaths is smaller, since persons suffering from the disease in mild form less often go to the hospitals. Epidemics in which a quarter of the patients, and even more, have succumbed have frequently occurred, especially in war times, during famines, &c. The cause (infective agent) of typhus fever is not known; according to recent investigations it is spread by vermin; Ricketts and others have fixed responsibility for it upon the body louse. The infection is communicated from man to man, and very often it is contracted from the clothes, linen, and other effects of

typhus patients. Recovery from the disease usually renders a person immune against a second attack. Typhus fever frequently appears nowadays in the eastern and south-eastern parts of Europe, in Hungary and Galicia, and also in Spain, Italy, and Ireland.

2. *Plague* appears in two forms, depending upon the place where the infective agent enters the body: the bubonic plague and the pneumonic plague. In the case of the former the painful plague-sores (buboës) develop, usually two or three days after infection, from the lymphatic glands; these sores,—which appear most often in the region of the groin, less often in the axilla, on the neck, lower jaw, and in other places,—soon suppurate. There is either a development of toxins, which are the cause of the severe general symptoms, or else the *bacilli pestis* go from the glands into the circulatory system and cause septicaemia, which is quickly fatal. Pneumonic plague takes the form of a catarrhal inflammation of the lungs, causing a profuse and bloody expectoration, which contains large quantities of bacilli. This form of the disease almost always ends fatally in a few days. The mortality of bubonic plague is somewhat lower; the disease has an average duration of eight days, and carries away from fifty to seventy per cent of its victims.

In the Middle Ages an epidemic of plague (black death) ravaged all Europe. At the present time it is still endemic in India, in southern China, in Egypt, in Uganda, and perhaps in other countries, whence it frequently develops into general epidemics.

The infective agent in the case of plague is the *bacillus pestis*, identified in 1894 by Kitasato, and subsequently, but independently, by Yersin. Rats, which are very susceptible to the disease, play an important rôle in spreading it; in India the outbreak of a plague epidemic is always preceded by the dying of large numbers of rats. Their excrement contains large quantities of bacilli, which may be destructive to human beings. The rat-flea is also known to carry the infection. The infection may be conveyed directly by plague patients, when the buboes suppurate, or when the blood becomes generally infected with the *bacilli pestis*, which are contained in abundance in the sputum, urine, and excrement, or when the lungs are affected and the patient charges the atmosphere by coughing. One who has recovered from the disease is usually immune for life.

3. *Cholera*, after an incubation period of two to eight days, begins with frequent (ten to twenty times a day) vomitings of a fluid like rice-water, and incessant retching. The patient, owing to the great loss of water, sinks rapidly; he acquires a corpse-like appearance, loses consciousness, and death may result on the first or second day. If the attack is survived, the patient frequently dies from sheer exhaustion afterwards. The mortality of cholera is great—from forty to fifty per cent of its victims die. In this calculation the numerous cases of cholericine, that are always prevalent during cholera times, are excluded. Recovery from the disease does not protect a person against contracting it again. The infective germ in the case of cholera is the 'comma bacillus', discovered by Robert Koch in 1883. The spread of cholera is caused by the penetration of the

*comma bacillus* into the alimentary canal, resulting from contact with objects which have been contaminated by the evacuations of cholera patients; less frequently it is indirectly caused by the pollution, from evacuations, of water used for drinking or washing purposes.

4. *Dysentery* has always played an important rôle in military campaigns. To be sure, it is not very dangerous, so far as the patient's life is concerned, but in war times, owing to irregular nursing and scanty nourishment, and the consequent use of unsuitable food, it may spread over a large territory and be very destructive to large numbers of soldiers and other people.

There are two distinct forms of the disease—amoebic dysentery and bacillary dysentery. The latter is caused by the *bacillus pyocyaneus*, discovered independently by Stiga, Kruse, and Flexner. The disease used to be common throughout Europe; at the present time it appears in Central and Western Europe only in small epidemics, whereas in Eastern Europe it spreads over large territories. It causes frequent, often blood-coloured, defecations, accompanied by gripping pains in the abdomen and a distressing pressure (tenesmus). The disease lasts from one to one and a half weeks, but for a long time after recovery the patient's alimentary canal is very sensitive to improper nourishment. The disease is transmitted either by direct contact, since the evacuations of the bowels contain large quantities of bacilli, or by infected water. Amoebic dysentery, occurring in tropical countries (Southern Europe, Egypt, Southern Asia, Central America, &c.), is much more dangerous; it is caused by an amoeba, carefully studied by Kartulis, and very often

acquires a chronic character, sometimes causing abscess of the liver.

5. *Typhoid fever* (called in England 'enteric fever', in France 'fièvre typhoïde', in Italy 'febbre tifoidea') in many wars has been very widespread among the armies; for example, in the American Civil War, in the Franco-German War (Metz), and in the Russo-Turkish War of 1877-8. The progress of the disease is well known; between the time of infection and the outbreak of the sickness nine to eleven days usually intervene, sometimes even as much as three weeks. In the first week the temperature of the patient rises slowly, during the second week it remains at about the same height, while in the third week it abates considerably, becoming normal in the course of the fourth week. The spleen enlarges a great deal, and in the second week small pale-red spots (roseola), scarcely as large as a pea, appear on the buttocks and especially on the belly. The patient's bowel-movements, at first normal, now becomes diarrhoeal, while certain psychic disorders also manifest themselves, usually in the form of a heavy somnolence. In the third week the patient's life is threatened by complications in the intestines—haemorrhage or perforation. Characteristic of the disease are the anatomical changes of the small intestine—at first enlargement, and later ulceration of Peyer's patches. The infective agent in the case of typhoid fever is a bacillus, identified by Gaffky in 1882. It lodges in the alimentary canal, and is conveyed by food that has been touched with hands to which matter containing the bacillus has adhered, or else in contaminated water used for drinking or other purposes. From eight to ten per cent of the

patients die, while a single recovery usually insures immunity against a second attack.

6. *Small-pox* has an incubation period of ten to fourteen days. The disease begins with a chill, accompanied by violent headache. On the third day the eruption appears; little papules develop and quickly change into pustules, showing themselves first on the face, then on the back, arms, and hands, and finally on the legs and feet. On the ninth day the pustules suppurate, and after that gradually dry up; if it progresses favourably, the disease is over in two or two and a half weeks.

In the case of small-pox the infective agent is not yet known; infection is caused by contact with a patient, or with objects which he is using or has used. It is particularly dangerous to touch things on which the contents of the pustules have dried, for such articles remain infectious for a long time. Recovery from the disease usually renders a person immune for life. The mortality in different epidemics varies greatly; most dangerous of all is the so-called 'black small-pox' (haemorrhagic small-pox, with bleeding in the pustules and under the skin). The total number of deaths in an epidemic of small-pox is dependent upon whether the disease appears in a vaccinated or an unvaccinated community; in the latter case the mortality may reach thirty per cent, whereas in the former case only three or four per cent of the patients die. Vaccination renders a person immune for eight to twelve years, while, if the disease breaks out anywhere in spite of vaccination, the number of fatal cases is very few. It should be noted that small-pox was formerly dreaded, not only because of its danger to life,

but also because it frequently leaves a person disfigured for life, and in rare instances causes total blindness.

7. *Scorbutus* (scurvy) used to be a common disease on ships, in prisons, and in times of famine; it appeared with the greatest malignancy in besieged cities—Thorn, Nuremberg, Alexandria, Port Arthur, &c. The real cause of the disease is unknown, although too much food of one kind, particularly lack of fresh vegetables, together with long confinement in poorly ventilated and dark rooms, are important causative factors. Inasmuch as the disease almost always appears in the form of an epidemic, it is probable that there is a specific infective agent. It begins with a general feeling of weakness; the skin and mucous membranes become pale and sallow, the gums become inflamed and ulcerated, and small and large extravasations of blood take place in the skin and muscles, and at the joints and knuckles. In serious cases haemorrhages occur in the intestines, kidneys, bladder, and uterus. A change of diet and surroundings will quickly cure scurvy; otherwise progressive anaemia will result in death.

# CHAPTER II

## THE TIME BEFORE THE THIRTY YEARS' WAR

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Numerous as are the historical notices in former years regarding the destruction of armies by pestilence, correspondingly few are the detailed reports on the spread of pestilence among the non-belligerent population. The best-known example from antiquity is the *Plague of Athens* (430–425 B.C.), described by Thucydides. The plague began in the second year of the Peloponnesian War, a few days after the invasion of the Peloponnesians. That it is famous is due to the classical description of it by Thucydides, himself a sufferer from the disease. The Plague of Athens broke out in the Piraeus, a fact which has led to the inference that it was borne thither by mariners from Egypt. At the time of the invasion of the Peloponnesians, thousands of country people fled to the city of Athens, which on the advice of Pericles opened its gates to them; thus more than 400,000 people were crowded together within its walls. The first outbreak of the plague lasted two years, then there was an intermission of a year and a half, whereupon it commenced anew. The second outbreak, according to Diodorus, carried away 4,400 hoplites, 300 cavalrymen, a large (but uncertain) number of other soldiers, and 10,000 women and slaves. The plague also penetrated to other places, sparing, however, the Peloponnesus. The nature of the sickness described by Thucydides cannot be positively determined; it has been

referred to as bubonic plague (Sprengel), as small-pox (Krause-Daremburg, Kobert), as typhus fever (Häser, Kanngiesser), as typhoid fever (Seitz), and even as anthrax. All we know for certain is that it was some highly infectious disease, recovery from which rendered a person immune. Krauss and Hecker believe that it was a special disease ('antique plague'), which no longer occurs.<sup>[3]</sup>

The *Plague of the Antonines*, also called the 'Plague of Galen', which ravaged Italy in A.D. 166-8, has also been brought into connexion with warlike events. Avidius Cassius, who preceded Verus in command of the army, had been sent to Syria for the purpose of suppressing a rebellion, and there, after the capture of Seleucia, the plague broke out. It was borne by the troops back to Rome, where, after the triumphal procession of 166, it spread far and wide, so that it was necessary to load its victims on wagons and carry them off for burial. The plague spread from Italy to Gaul, to the very banks of the Rhine, and a large part of the province was literally depopulated—decayed and deserted villages were found everywhere. Häser inclines to the view that it was an epidemic of small-pox, while Laveran, Hecker, Krause, and Littré believe that it was neither small-pox nor typhus fever, but 'antique plague'.<sup>[4]</sup>

The expeditions of the German emperors to Italy, as well as the Crusades, offer numerous examples of how large armies may be destroyed by disease. So, for instance, in 963 or 964 the army of the Emperor Otto I was attacked by a severe pestilence in Italy—a murderous disease which was usually fatal in twenty-four hours. The German army of Henry IV in 1081-2, but especially after the capture of Rome

on June 3, 1083, suffered from plagues in Italy; but the same army fared even worse in 1084, when a plague broke out and carried away, for example, the entire German garrison in Rome. In 1137 Lothair's army was likewise attacked by infectious diseases in Italy. But by far the most devastating of all was the pestilence which broke out in Rome in August, 1167, shortly after the capture of the city by Frederick Barbarossa, and paved the way to a catastrophe which culminated in the complete annihilation of the German army. At that time many eminent men succumbed to the disease, the army dwindled away in the hands of the leaders, and the soldiers fled in vast numbers in order to escape certain death. Even after the Emperor Barbarossa's withdrawal from Rome the pestilence continued to rage in his army, and it was a long time before it disappeared from the city. It was the true (bubonic) plague, and usually resulted fatally on the first day. In the winter of 1190-1 a pestilence broke out in Lower Italy in the army of Henry VI; it appeared at the beginning of the siege of Naples and carried away many eminent men. The king himself contracted the disease, and had to be taken to Capua.<sup>[5]</sup>

The armies of the Crusades fared even worse; the mortality in the First Crusade, before and after the conquest of Antioch (1097-8), was terrible. The pestilence is said to have broken out first among the children and women who accompanied the armies, and its dissemination was favoured by a lack of sustenance and continual rainfall; from September to the 24th of November the pestilence carried away 100,000. The nature of the disease is not known, although it is known to have been very infectious. When a

new army of 1,500 Germans arrived, it was quickly attacked by the disease and in a few days almost completely annihilated. Several hundred frequently died in a single day, and as the summer of 1099 was very hot and a number of bodies remained unburied, the pestilence lasted well into that year. In 1100 another pestilence raged among the crusaders. Again, during the Second Crusade a severe epidemic broke out in the army of the Emperor Louis VII at Attalia in Asia Minor; the pestilence spread rapidly among the inhabitants of the city, so that many houses, even entire streets, were depopulated.<sup>[6]</sup>

During the Third Crusade, shortly after the death of Frederick Barbarossa (June, 1190), a severe pestilence broke out in the army that was besieging Antioch; according to Michaux only 5,000 infantrymen and 700 cavalrymen survived out of the entire German army.<sup>[7]</sup> At the siege of Acre (Ptolemais), which lasted from August 1189, to July 1191, there broke out in the winter of 1191 a terrible pestilence which played havoc in the pilgrim army; it was caused by an inadequate supply of food, and its symptoms (enlargement of the limbs and falling out of the teeth) betoken scurvy. It also appeared in the army of Saladin, but was much worse in the Christian army, in which from 100 to 200 crusaders died every day. Duke Frederick of Swabia succumbed to this disease on January 20, 1191.<sup>[8]</sup>

At the time of the crusade against the heretics a serious pestilence broke out in Egypt in the army of the crusaders, which had already, on August 12, 1218, suffered from dysentery; it appeared in December during the siege of Damietta, after a heavy and continuous downfall of rain.

'The patients', says Wilken, 'were suddenly seized with violent pains in the feet and ankles; their gums became swollen, their teeth loose and useless, while their hips and shin bones first turned black and then putrefied. Finally, an easy and peaceful death, like a gentle sleep, put an end to their sufferings. A sixth of the pilgrim army was carried away by this disease, which no medicine could cure.'<sup>[9]</sup> Only a few patients who survived the winter were helped to recovery by the warmth of spring. It was unquestionably a severe form of scurvy. The besieged, too, suffered from the destructive pestilence, and also from Egyptian ophthalmia. We read further in Wilken: 'A horrible sight greeted the pilgrims when they took possession of Damietta. Not only the houses, but even the streets were filled with unburied corpses; in the beds dead bodies lay beside helpless and dying invalids, and the infection of the air was intolerable. Of 80,000 inhabitants which the city had had at the beginning of the siege only 3,000 were left, while only 100 of these were healthy.'<sup>[10]</sup> Other reports say that 10,000 inhabitants survived.

In 1270, during the Seventh and last Crusade, which strangely enough passed by way of Tunis, a pestilential disease broke out in Carthage, carrying away, in addition to many soldiers and men of rank, King Louis IX of France himself and his son, Jean Tristan. This pestilence was dysentery, and it spread even to Sicily, whither the king's body was conveyed. After the king's death conditions were even worse, since so many people died that it was impossible to bury all the bodies. The disease also attacked the enemy's army.<sup>[11]</sup>

The increased prevalence of *leprosy* in Europe in the Middle Ages is often attributed to the Crusades.<sup>[12]</sup> Leprosy was very widespread in Germany, France, Italy, and other countries of Europe before the Crusades; according to Hirsch it appeared in the Roman Empire in the first century before the birth of Christ, but did not become very prevalent until later. Legal regulations governing the marrying of lepers date back as far as the seventh century, while the earliest reports regarding leper-houses come down from the eighth and ninth centuries. Most leper-houses, however, were built between the eleventh and thirteenth centuries, and although the reverse opinion has been expressed, it is nevertheless improbable that the building of these houses was not due to the increased prevalence of the disease. Inasmuch as leprosy was very widespread in the Orient, where numerous crusaders contracted it, as indicated by the fact that institutions were founded there for its victims, many crusaders doubtless returned with the disease in their systems. But regarding this matter we shall never have absolutely reliable information; for it is assumed that many people suffering from other chronic skin diseases were placed in the leper-houses. A careful study of the available data, however, leads us to believe that wrong diagnoses were not so frequent as to account for the large number of cases of leprosy in the eleventh, twelfth, and thirteenth centuries. Admittance to leper-houses was regulated by many precautionary measures, and the diagnosis of the disease was made by churchmen, even bishops, who without doubt necessarily acquired a good eye for the disease in the course of time. Not until later, when we may

be certain that leprosy was no longer brought from the Orient, was the disease probably now and then confused with syphilis.

The notable pandemic outbreak of syphilis at the end of the fifteenth century was also largely attributable to warlike events. The rapid spread of the disease throughout Central Europe was due, according to contemporary notices, to the *Landsknechte* (common foot-soldiers). The rough coincidence of this epidemic with the discovery of America has given rise to the view that the disease did not exist in Europe at earlier periods, but was borne thither from America. But we can point to numerous instances in the course of the last century, of how infectious diseases, hitherto unknown, or existing only sporadically, all of a sudden became pandemic (cholera, plague, diphtheria, influenza), although no satisfactory and comprehensive explanation of the phenomenon has been offered. It is generally known that infectious diseases break out in a mild form and last for years, and then suddenly change their character and cause virulent epidemics; this is positively confirmed by the epidemic of small-pox in 1870-2, which will be discussed later. At all events we cannot draw the conclusion from the sudden outbreak of an epidemic of syphilis, that the disease was not present in Europe before.

A serious epidemic of syphilis broke out in the army of Charles VIII of France during his expedition to Naples. Inasmuch as his advance was nowhere opposed, he was able to enter Naples on February 12, 1495. There the French army gave itself over to the most unbridled licentiousness, and the result was that the disease spread rapidly in both

the French and Italian armies. Italians and Frenchmen accused each other of having brought the disease, so that the former called syphilis 'French disease' and the latter 'Neapolitan disease'. The disbanding of Charles's army caused the disease to spread far and wide in Europe. 'Those who had most to do with the further dissemination of the disease,' says Häser,<sup>[13]</sup> 'were the Albanian and Roumanian estradiots serving in the Venetian army, brutal and rapacious adventurers, and also the German and Swiss *Landsknechte* returning from Italy, who spread the disease over a large part of Europe.'

A large number of writers of the beginning of the sixteenth century bear witness to the fact that the pestilence was borne into Germany by *Landsknechte*; e.g. Pastor N. Berler (*Ruffachische Chronik* of 1510), Heinrich Brennwald (1519), Johann Haselbergk (1533), Valentin Müntzer (1550), *Nuremberg Chronicle* of 1580.<sup>[14]</sup> In the year 1495 the pestilence broke out in many places in France and Germany; in Strassburg, for example, the disease was planted by *Landsknechte* who had served in, and been discharged from, the army of Charles VIII; Hans Schott testifies to this fact in his *Weltlich Leyenbuch* (Strassburg, 1541). The city of Metz tried in vain to ward off the disease; according to the *Metz Chronicle*, many Burgundians (500 cavalrymen and 700 infantrymen) came to Metz in May 1495, and since the most of them were suffering from *mal de Naples*, they were not allowed to enter the city. But the soldiers infected the women in the vicinity, and the disease was later borne by them into the city, where it prevailed for four years, not beginning to abate until the year 1500.<sup>[15]</sup>

We also have testimony to the fact that the outbreak of the disease in Nördlingen (1495) was caused by the arrival of *Landsknechte*.

In a supplementary way we may add here that later wars also caused frequent epidemics of syphilis within narrow confines; instances of this kind are cited by A. Hirsch<sup>[16]</sup> and H. Schwiening.<sup>[17]</sup>

In August of the year 1486 *English sweating-sickness* appeared in England for the first time; it broke out among the troops of Henry VII shortly before his victory at Bosworth on August 22, 1486. And when Henry landed at Milford the disease spread, carrying away many victims wherever it went. 'Strong and well-nourished people were particularly susceptible to it—more so than old men, children, and poor people. From three to nine, sometimes all the inmates of a house caught it, and it gradually spread over half the inhabitants of the town. The first appearance of the disease is said to have caused more devastation in London (where it broke out on September 21), Bedford, and Cambridge, than the sword, which had been ruling for thirty years in a fearful civil war. According to Forest, an incredible number of people died from it, while Thomas Moore also speaks of the dangerous character of this epidemic. In many places a third of the inhabitants are said to have died from it, scarcely one in a hundred of its victims recovering.'<sup>[18]</sup> The subsequent appearance of the disease, especially the transplantation of it to the continent in the year 1529, was not attributable to warlike events. In the year 1551 it disappeared as suddenly as it had appeared in 1486.

The disease usually began with a chill, headache, palpitation of the heart, difficulty in breathing, and later a profuse, very malodorous emission of sweat from all parts of the body. The patient quickly lapsed into a state of lethargy. The progress of the disease was uncommonly rapid; 'in one day either the disease or the patient came to an end,' says Fracastorius. Any patient who did not succumb, recovered completely after one or two weeks.

From the sixteenth century on notices are more abundant; we now hear of epidemics of typhus fever throughout all Europe, although we do not know positively where the disease first appeared. 'At all times,' says Hirsch, [19] 'as far back as historical investigation is able to follow the course of typhus fever at all, the disease has always been bound up with the most dismal calamities of the nations. The supposition is therefore justified that, in the numerous war-pestilences and famine-pestilences of antiquity and the Middle Ages, regarding which we have no medical reports and must rely only upon the chronicles, typhus fever has played a conspicuous rôle.' By this, however, Hirsch does not mean to say that the specific disease in all the so-called war-pestilences was typhus fever; on the contrary, he adds: 'In saying this I by no means wish to imply that I always identify "war-pestilences" and "famine-pestilences" with epidemics of typhus fever; those pestilences, appearing at epochs of general misery, for the most part represent a mixture of diseases, especially catarrh of the stomach, dysentery, scurvy, typhus fever, and frequently malaria and typhoid fever, which not only by chroniclers, but also by medical statisticians, have quite

often been lumped together as *one disease*.' It is to-day almost impossible to analyse these accounts, in which we can distinguish only individual characteristics of those various diseases. This appears most distinctly in the reports of the chroniclers and historians regarding the war pestilences and famine pestilences of antiquity, and it also explains the futile effort of the historians to reduce to one disease known to us the numerous and complicated symptoms which they have looked upon as the expression of a single disease-process—an effort which has led some of them to the somewhat extravagant conclusion, that they were diseases which are now extinct. The same backwardness, furthermore, characterizes—though to a lesser extent—the descriptions which the physicians of the seventeenth and eighteenth centuries wrote of the epidemics of 'putrid fever', 'biliary fever', and 'mucous fever' occurring at that time. Here, too, in many cases it was evidently a question of the simultaneous outbreak of various diseases, the nature of which even the most expert critic could not afterwards determine with certainty.

At the end of the fifteenth century typhus fever was prevalent in many parts of Europe; the first scientific account of it comes from the pen of Fracastorius, who had an opportunity to observe the disease during the epidemics in Italy in 1505-8, and who described it as a disease indigenous to Cyprus and the neighbouring islands and appearing for the first time in Italy.

The names given to the disease were numerous and cannot all be mentioned here; the name 'Hauptweh' (headache) or 'Hauptkrankheit' (head-disease) was current

in Germany, while the additional words 'ohne Sterbedrüsen' (without death glands) expressly distinguish the disease from bubonic plague. T. von Györy<sup>[20]</sup> mentions a large number of synonyms—Hungarian disease, lazaret fever, spotted fever, petechial disease, &c.

In 1490 the disease was borne by Spanish soldiers, who had fought in the Venetian army against Turkey, from Cyprus to Spain, and during the war of Ferdinand the Catholic against the Moors it spread to Granada and did more damage to the Spanish army than the swords of the Moors. <sup>[21]</sup>

In the year 1490 a serious epidemic broke out in Lorraine, which Maréchal and Didion<sup>[22]</sup> think was typhus fever; it appeared in that bitter and indescribably cruel conflict between René, Duke of Lorraine, and the people of Metz. Despite the armistice proclaimed on June 18, the pestilence spread far and wide and in August entered Metz, compelling the inhabitants to take to flight; the nobles retired to their castles, and the citizens went out into the country. And although the city was strictly quarantined, the disease spread throughout Lorraine and northern Alsace.

In the year 1528 an epidemic of typhus fever occurred in connexion with warlike events. This pestilence broke out in Upper Italy and spread to Lower Italy, where a war was going on between French troops on the one side and German and Spanish troops on the other. The loss of human life was uncommonly large, 30,000 French soldiers and twice as many non-belligerent inhabitants are said to have died. And the pestilence was also borne from Italy to Germany.

Well known in history is the great pestilence which in 1552 forced Emperor Charles V to raise the siege of Metz, which had been going on for two months (November and December). Maréchal gives us detailed information about this;<sup>[23]</sup> the Emperor's army, he says, which consisted of 80,000 German, Spanish, and Italian troops, in addition to the enormous camp-following that always accompanied armies at that time, was reduced one-third by the end of December through desertion, disease, and disablement. According to the report of the Venetian physician, Andreas Gratiolo, the widespread diseases were typhus fever and dysentery. The appearance of these diseases was favoured by the congregating of such enormous numbers of people in tents and inadequate places of shelter, and also by the great dampness and the lack of the necessaries of life. The extreme cold, which prevented the dispersion and isolation of the patients, also favoured the dissemination of the disease. More than 200 men died in the barracks every day, while 10,000 men, all told, are said to have succumbed. It was also observed that the Spaniards and Italians suffered more than the *Landsknechte* and other German troops, since they could not stand the severity of the climate so well. During the siege, hospital-fever and scurvy raged in the city itself, and after the siege was raised, in the night of January 1, 1553, typhus fever broke out there, having been borne into the hospitals by wounded soldiers from the enemy's camp, or else brought back by citizens who had been out to inspect the position of the besiegers. During the siege the surrounding country had been most terribly ravaged by the enemy's soldiers, so that the inhabitants