Plagues ancient and modern, or, The Black Death and the sweating sickness / by Joseph Frank Payne.

Contributors

Payne, Joseph Frank, 1840-1910.
Royal College of Surgeons of England

Publication/Creation

London : Printed by Adlard and Son, 1889.

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PLAGUES ANCIENT AND MODERN;

OR,

THE BLACK DEATH AND THE SWEATING SICKNESS.

BY

JOSEPH FRANK PAYNE, M.D., F.R.C.P.

Reprinted from Vol. XVII of the 'St. Thomas's Hospital Reports.'

LONDON:
PRINTED BY
ADLARD AND SON, BARTHOLOMEW CLOSE.
1889.

PLAGUES ANCIENT AND MODERN;

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THE BLACK DEATH AND THE SWEATING SICKNESS.[1]

By JOSEPH FRANK PAYNE, M.D., F.R.C.P.

I have called this lecture Plagues Ancient and Modern, and when I use the word "plague" you will at once perceive that I am not speaking of a disease, or diseases, which we are likely to meet with every day. The name at once calls up before us the image either of a malady peculiar to Oriental lands of which we have read in books of travel, or else of some terrible occurrence in the history of our own country which happened a long time ago, and from which we have no longer anything to fear.

My subject, therefore, you will perhaps think, is somewhat wanting in actuality. But while it is quite true that at the present time and in these favoured regions we need hardly expect to meet with those pestilences which are matters of history, the striking fact to which I desire to draw your attention is this, that if we were able to explore the whole world, we should meet at some place or other with examples of these "historical" diseases. To make this clear we must consider their relations of place on the one hand, and their relations of time on the other.

[1] A lecture delivered at the Parkes Museum of Hygiene, Feb. 16th, 1888.

The study of such relations has of late years given rise to two new branches of medical science, the Geography and the History of Disease. It is impossible in one lecture to attempt to give even the barest outline of these deeply interesting subjects. Nevertheless, by fixing our attention on one or two of the more important of those maladies which are called specific, we may be able to see how closely the geography and the history of disease are related, both to one another, and to the nature of disease in general, and what interesting conclusions not only of medical but of social and political importance may be derived from them.

I will begin, then, by drawing your attention to a few facts relating to the geographical distribution of certain specific diseases. Now, by specific diseases we mean such as are believed and in many instances are proved to be caused by some definite material agent. This material agent is one capable of producing a certain set of symptoms which run a definite course, and by which, therefore, the disease can always be recognised; it is also an agent capable of multiplying itself, so far as we can see, almost indefinitely, so that having generated a disease in one individual it may go on generating the same in an ever-increasing number of others.

It is not necessary for our present purpose to inquire precisely what the nature of this morbid agent may be, but it is doubtless well known to most of those present that such diseases as I am now speaking of are very generally believed to be produced by living organisms. The bacterial or so-called germ theory of disease which recognises the operation of these living agencies is one of increasing interest and importance in medical science. But as it has been quite lately discussed in this room I need not say more on the subject than to attempt to show how far this theory is supported by the general laws of distribution of specific diseases over the world.

I speak first then of the GEOGRAPHY of such diseases. It is not difficult to call to mind examples of diseases which are native in, or peculiar to, certain places. We have, for instance, yellow fever, which is found chiefly in the New World and certain adjacent parts of the Old Continent. It appears to radiate from the Gulf of Mexico as a centre. Sometimes it travels northwards to the rivers and harbours of North

America; sometimes in the other direction along the South American coast. Sometimes it has crossed the Atlantic to Europe, infecting Spain and Portugal and their southern ports. It has even, in rare cases, travelled as far as our own country and effected a landing in our own harbours, such as Southampton and Swansea. Leprosy, again, though largely distributed over the world, is found only in certain countries. It is widely spread in India, China, and South-Eastern Asia, and is found in many islands of the southern seas. In Europe, on the other hand, it is now confined to a few scattered localities, some in the north as Norway; some in the south as parts of Italy and Southern Russia; so that if cases of this disease occur in our own country, or in Central Europe, they are, for the most part, traceable to importation from one of the localities it inhabits. There is, again, a peculiar and formidable disease known as kakké, which is peculiar to Japan and certain parts of the Asiatic Continent.

But we need not go beyond our own island for instances of this geographical limitation of disease. Ague, which was once widely spread, is now found only in limited tracts of certain counties. The swelling of the throat called "goitre," or "Derbyshire neck," is well known to affect the natives of certain mountainous districts only, as is, indeed, recognised in its popular name. Not to multiply instances, I would only mention that the terrible malady which we call specially and definitely "the plague" has a remarkably limited geographical range, being found only, so far as we know, in the following parts of the world: At one station on the North Coast of Africa in the neighbourhood of Benghazi, in one district of Arabia, in certain parts of Persia and the adjacent region of Turkish Arabia, in a few localities of Northern India, and in one district in the South of China.

Now, if we inquire how this remarkable limitation of certain specific diseases to certain definite localities is to be accounted for, the first explanation which will naturally suggest itself is that this limitation must be due to climate; that is, to temperature, moisture, and other physical conditions. But when we find that such conditions in the several places where any particular disease is found are by no means uniform, and further, that other places presenting the same physical con-

ditions may be free from that disease, it is clear that this explanation cannot suffice. It may, again, be supposed that social habits and circumstances, such as uncleanliness, poverty, and the like, may account for the prevalence of special diseases. But a very little consideration again will show that those causes do not supply any adequate explanation. For these depressing conditions may and do exist in many parts of the world without producing in each case the same diseases, and even without producing any specific disease at all. We cannot attribute then either to material or to social causes, any other effect than a negative one, that is to say, they may make the occurrence, or the spread, of certain diseases in certain places impossible. Plague, for instance, does not occur within the tropics, being infallibly destroyed by an air temperature of something over 100 degrees or even less. Yellow fever seldom spreads or at least persists at any considerable distance from the sea or rivers; but these considerations do not in the least explain why the plague is limited to the Old World, or why yellow fever has its chief home in the New, why kakké is confined to Eastern Asia, or why leprosy has, at the present time, no home in Europe except in certain scattered localities.

The whole problem of the geographical distribution of disease is very intricate. Without pretending to give it a definite solution, I would only point out that it is essentially the same as that presented by the geographical distribution of plants and animals. It has long been recognised that the distribution of organic life over the globe is governed by other laws than those of heat and moisture, or any other climatic conditions. The words of Alexander von Humboldt, written many years ago, may even now be worth quoting on this subject:—"Each hemisphere produces plants of different species, and it is not by the diversity of climate alone that we can explain why Equinoctial Africa has no laurels and the New World no heaths; why the tiger is peculiar to Asia and the ornithorhynchus to Australia. The attempts made to explain the distribution of species on the globe by the influence of climate alone take their date from a period when physical geography was still in its infancy." Since the time of Humboldt much progress has been made in explaining the

geography of organic life, and even if everything cannot be accounted for, it is seen that the broad facts of distribution are referable to two great laws, the law of specific centres and the law of migration. By these laws I mean that species of animals and plants have arisen by evolution in certain spots and regions of the globe, and from these have made their way in many cases to other parts by active or passive migration. That is to say, they have either wandered themselves or been carried; their spread being limited partly by natural obstacles to migration and partly by the fitness or unfitness of any particular region to supply the conditions necessary for their life.

Now, that the same laws govern the distribution of certain specific diseases is a truth less generally recognised, and the problem is obscured by a great number of complications depending upon the wide diffusion of diseases and their connection with migrations of men. But when due allowance is made for this and other causes of irregularity, we say that for what we call "specific diseases" the same laws hold as for species of animals and plants; that they rise at particular centres or in particular regions, and their further distribution is due to migration from these centres or regions into others which offer suitable conditions for their temporary or continued existence.

We must now consider the second of the two aspects of disease which I mentioned just now, namely, the History of diseases, but it will be only possible to touch upon so much of this subject as has a bearing upon their geography. The history of disease, as a whole, is an almost untrodden field, in which little solid progress has been made except in relation to certain episodes in this history which are generally known by the name of epidemics. By an epidemic we mean the prevalence at a particular time over a wide or a limited area of a malady either entirely new or manifesting itself in an intense and exaggerated form. The study of epidemics has, I need not say, of late years assumed great importance, and is gradually forming itself into a distinct branch of medicine, which has received the name of "epidemiology." The special interest which it possesses for the general public is that it forms a point of contact between

medical science and social science in the widest sense. History and politics have their part in it as well as pathology and practical medicine.

All I can hope to show by a brief glance at the history of some of the great epidemical diseases is to confirm the conclusion that they are governed by the same laws as account for the geographical distribution of plants and animals.

The history of these diseases is essentially one of repeated migrations from certain specific centres. They have existed as so-called endemic or native diseases in certain parts of the world so far back as our knowledge extends. They have spread from these centres at various times, and have made longer or shorter migrations into regions other than their original home. These excursions have sometimes lasted for weeks, sometimes for years, sometimes for centuries, in some instances have ended in what we must call "permanent colonisation."

The best instance of these laws is seen in the history of that most formidable of all epidemic diseases, the plague—a name of dread for centuries, and still capable of causing a panic throughout the civilised world;—the Plague of the Middle Ages, the Plague of London in 1665, the Plague of Southern Russia in 1879, and the plague which still holds its ground in certain districts of the East. By this name I mean a certain definite disease—not merely a destructive epidemic or pestilence. I do not include, for instance, the celebrated Plague of Athens, described by Thucydides, since its true medical character is still uncertain; nor can we say anything more definite about the celebrated pestilence which devastated nearly the whole Roman world in the reign of Marcus Aurelius, though its origin and history show many features characteristic of later epidemics. These diseases were not the plague in the sense in which we now understand it.

The disease which it is now generally agreed to call by that name was first known in Europe in the reign of the Emperor Justinian, and formed part of a great cycle of extraordinary natural phenomena which lasted for fifty years, and which are the theme of a well-known chapter in Gibbon's history. This formidable epidemic was believed to have originated in Egypt about the year A.D. 542. From there it spread in

one direction, westward, along the North of Africa, in another, northward and westward, to Constantinople and over the Continent of Europe. In four years it had made its way over the whole of Gaul, and there is great reason to believe that it spread even to our own country, since the obscure historical notices, which are our only guide, state that destructive pestilences raged at the same time in England and Scotland. Into the symptoms of this disease I need not enter further than to say that they appear to have been the same as have characterised the plague in all its subsequent appearances. In its mode of extension and in its social consequences it had a striking resemblance to the other destructive pestilences which have since at various times spread over Europe. The destruction which it caused was not less terrible than in the great epidemics of later times. In Italy large tracts of country went out of cultivation, and the remnant of the rustic population crowded into the towns. Even to this day the traces of this terrible devastation may be seen in the features of Italian landscape. Ruined homesteads, monuments uncared for, wide tracts of Campagna desolate and poisonous with malaria—all the picturesque incidents of a land falling back into its primitive wildness—these, with which a long succession of painters, from Salvator Rosa to Wilson, have made us familiar, date, we are told, from the ravages of the plague of Justinian. In Northern lands the growth of population and industry have covered up the traces of pestilence as completely as they have covered up the horrors of the battlefield; but Italy, or at least Southern Italy, has never recovered its primitive prosperity. In the Eastern Empire the destruction was even more complete. A good authority—Hæser—calculates that the greater part of the population of the Greek Empire was attacked, and that more than half of those attacked succumbed. The political consequences of this great destruction of human life were not less striking and ineffaceable than the social results. It cannot have been a mere coincidence that it was precisely in the sixth century the Goths were enabled to establish themselves with a firm footing in Northern Italy, and to found there the Kingdom of Lombardy. But notwithstanding, after fifty years of alternate advance and retreat, this great plague

finally subsided. For some centuries after we read of numerous pestilences which may or may not have been the same disease as that of the sixth century; but a great overwhelming outbreak spreading over the whole of Europe does not appear again till the time of the most formidable of all recorded plagues, the Black Death of the fourteenth century.

This terrible disease was certainly believed by contemporaries to be one new to Europe, and this fact, together with its great destructiveness, tends to support the opinion that the epidemics of preceding centuries which we have been compelled to pass over were not entirely, or perhaps not chiefly, the true plague, as the Black Death, notwithstanding some peculiar features, undoubtedly was. It is, however, noteworthy that while the origin of the plague has generally been thought to be in Egypt, or at least that was the source whence Europe derived it, the origin of the Black Death was almost certainly in Asia. Are we to suppose from this that the plague has two original seats—one in Africa and the other in Asia? Or may one of these have been derived from the other? This question we have no materials which enable us positively to answer. The earliest notices of plague in western history dating from the third century undoubtedly lead us back to Africa, Egypt, and the neighbouring lands. But it has now ceased to exist there while it survives in Asia; and possibly if we could follow the history far enough back we might find that the African was a colony of the Asiatic plague. This, however, is a matter of speculation. What is certain is that Europe has sometimes derived the plague from Africa and sometimes from Asia, and that the epidemics of Asiatic origin have generally been, for some reason, the most destructive. It may, perhaps, be thought, and in fact has often been suggested, that since the disease was already known in Europe its remarkable development in the fourteenth century was of European growth, and did not require any foreign importation; but for many reasons, which cannot be discussed here, I think such a view would be erroneous and that the Black Death was in a very definite sense imported from Asia. Contemporary records, indeed, put this beyond a doubt.

Mediæval Europe was, of course, profoundly ignorant of

what was happening in the far East; its knowledge of Asia was confined to a few points where the trade of the East and West came in contact. And from one of these points our most certain knowledge of the eastern epidemic was derived. The Crimea and the shores of the Sea of Azoff formed at that time an important trade route between Europe and Asia. In these parts the Italians, especially the Genoese and Venetians, formed settlements where an important trade was carried on with the Tartars. It was here that a Genoese lawyer, Gabriel de Mussis, observed the march of the disease, which he accompanied, or, indeed, helped to convey to Europe. He left behind him a written description of his experiences, which has been published from the original MS., and is a document of most remarkable interest. It will be worth while to give a portion literally translated from his Latin:

He says, "In the year 1346 innumerable tribes of Tartars and Saracens perished in these regions by an inexplicable disease. Whole tracts of country, innumerable provinces, splendid kingdoms, cities, camps, and towns abounding in population, were attacked by a horrible death, and in a short time denuded of their inhabitants. Now a town called Thanna, in the eastern region towards the north, a place trading with Contantinople, was besieged and conquered by a great army of Tartars; and it happened that the Christian merchants, driven out by force, took refuge within the walls of Caffe, which the Genoese had formerly built in that region. Suddenly the infidel tribes of Tartars, collecting from all sides, surrounded the city and besieged the Christians, who were shut up there for nearly three years; when lo! a disease attacked the Tartars, and the whole of the besieging army fell into a state of weakness and disorder so that many thousands of them died daily. It seemed to the besieged Christians as if arrows were shot out of the sky to strike and humble the pride of the infidels, who rapidly died with marks on their bodies and lumps in their joints and several parts, followed by putrid fever; all advice and help of the doctors being of no avail. Whereupon the Tartars, worn out by this pestilential disease, and falling on all sides as if thunderstruck, and seeing that they were perishing hopelessly, ordered the corpses to be placed upon their engines and thrown into the city of Caffe.

Accordingly were the bodies of the dead hurled over the walls, so that the Christians were not able to hide or protect themselves from this danger, although they carried away as many dead as possible and threw them into the sea. But soon the whole air became infected, and the water poisoned, and such a pestilence grew up that scarcely one out of a thousand was able to escape.

"Thus were the Orientals in all parts, both those who lived on the southern shore and those on the north, struck down by this pestilential disease, and almost all of them died. So great was the mortality that Kathayans, Indians, Persians, Medes, Armenians, Georgians, Turcomans, Arabs, Saracens, and Greeks throughout the whole of the East, gave themselves up to clamour, weeping, and sighs, and remained in this distress from the above-mentioned year to 1348, expecting that the Day of Judgment was at hand.

"Now, it so happened that a ship left the aforesaid land of Caffe, having on board a few sailors (who were also infected with the pestilential disease), and made for Genoa—some other ships going also to Venice and others to other parts of Christendom. Marvellous to relate, whenever the navigators arrived at any land, as if some malignant spirits accompanied them, wherever they mingled with other men the latter perished. Every city, every town, every country, and their inhabitants of both sexes, poisoned by the pestiferous contagion of the diseased, fell a prey to sudden death, and when one began to be sick, soon falling and dying, he poisoned the whole of the family. Those who came in to bury the bodies perished by the same disease. Thus whole cities and castles were made desolate, and only the waste places themselves were left to mourn for their dead inhabitants.

"Alas! when our ships arrived at any city and we entered our houses, our relatives, our connections and neighbours, flocked in to see us from all sides, because we were still in bad health, and out of a thousand who sailed with us scarce ten survived; but alas! we carried with us the arrows of death. And while they were embracing and kissing us we could not help pouring out poison from the lips with which we spoke. So they, returning to their houses, soon poisoned their own families, and within three days the whole household, struck

down, succumbed to the dart of death, and the number of the dead increased so much that the ground was not sufficient for their graves. Priests and doctors, whom their great care for the sick compelled to be present at the death-bed, alas! returned home sick themselves, and quickly followed the deceased."

This account, which bears the unmistakable stamp of authenticity, doubtless shows us one route by which the Black Death entered Europe, namely, from China through Tartary, and thence by the Black Sea to the Mediterranean; but there were two other ways by which the disease also approached, namely, by way of Tiflis and Armenia into Asia Minor, and by the way of Mesopotamia and the Euphrates into Egypt.

By all these three routes there can be no doubt that the Eastern pestilence invaded Europe, and it is said to have entered Southern Italy and the Mediterranean a year before the invasion of Northern Italy described by Gabriel de Mussis whom we have quoted.

Without dwelling upon the successive outbreaks which are recorded in several parts of the Continent, I will only say that it reached the West of England while Edward III was king, in the early part of 1348, and towards the close of the year invaded London, where 100,000 people are said to have died, while in 1349 it is heard of in the Midland Counties and East Anglia, after which for ten years or more it prevailed intermittently throughout the country. A striking evidence of the way in which the disease gradually spread farther from its original seat is that Scotland and Ireland were at first exempt, so that in North Britain "the foul death of England" became a proverbial expression. But in later years those countries were also affected. The question will naturally be asked, In what way was the pestilence spread? Was it by direct contagion only, or by indirect contagion through material objects? or was it through the air? or was it possible, as some have imagined, that the disease was not really conveyed at all, but broke out in these different places successively under the influence of some epidemic or generally acting cause? I think there can be no doubt that contagion, that is, contact or association with persons affected with the disease, was the chief means by which healthy persons con-

tracted it, and it was thus that it travelled from one place to another. The facts just mentioned relating to Scotland and Ireland would indeed be enough to show that it did not originate independently in the different countries which it successively affected. But a remarkable fact, often observed also in other epidemics of plague and typhus, is evident from the account quoted just now, namely, that persons not suffering from the disease might be the means of conveying it to others. Thus Gabriel de Mussis clearly states that he himself, not suffering from the plague, although he was in bad health, conveyed contagion to his relatives and neighbours. The same thing has often been observed in the contagion of the terrible gaol fever or typhus, which in former days often spread in courts of justice, from the prisoner in the dock to the judges, lawyers, and other persons in court; so that, for instance, at the celebrated Black Assizes at Oxford in July 1577, 510 men died in a month from an infection caught in the castle and court-house.

But in these cases it must be remembered that the persons who brought the infection, though they had not the disease themselves, yet came from among those who had. Typhus was almost constantly present in gaols, and many persons died of it. But those who escaped, either from not being liable to the complaint, or having gone through it and recovered, were able to give the infection to others, so that there was nothing surprising in the fact that the survivors carried the infection away with them.

The Genoese navigators were the sole survivors of a party, 99 per cent. which had died, presumably of the plague, and the ship which brought them back had doubtless been converted into a floating focus of contagion.

The spread of diseases like plague through the air seems by no means improbable for short distances, such, for instance, as are measured by yards; but there are no facts to show that such a transmission can take place over distances measured by miles. In the main, then, the disease was, as plague is now, transmitted chiefly by personal intercourse.

The general facts of the mortality and devastation caused by the Black Death have so often been recorded that I will only briefly refer to them.

In England it is supposed that one third of the population may have perished in the successive epidemics; and looking at the remarkable statistics collected for certain districts, as, for instance, by Dr. Jessop for East Anglia, this would seem to be probably not an over-statement. Hecker calculates that twenty-five millions of persons, or a quarter of the then population of Europe, died; but such numbers are more or less conjectural.

The consequences were economically most disastrous. In England a great part of the country remained untilled, and the deficiency of labourers was such as to cause a sudden rise of wages which it was repeatedly attempted to check by legislation. However, as good comes out of evil, the scarcity of labour is thought by some authorities, as by Professor Rogers, to have ultimately brought about the final emancipation of the labouring class, by the conversion of serfs into free labourers.

Now let us look for a moment at the progress and decline of plague in Europe. By 1357 there was a manifest cessation of the disease in England, but formidable recurrences took place known as the second and third plagues of Edward III, in 1361 and 1368. The general course of epidemics throughout the Continent was nearly the same. For nearly a century plague continued to recur with great violence in many parts of Europe, and about the middle of the fifteenth century, one hundred years after the Black Death, a formidable wave of pestilence passed over Enrope, beginning in the South, which was attributed, and probably with justice, to a fresh importation from the East. But the mortality altogether was much less than in the preceding century.

The sixteenth century would appear at the first glance to have been visited as severely as the preceding ages. Nevertheless, on the whole a decline is observable both in the number and severity of the epidemics. It was generally believed that fresh importations took place from Constantinople and the East. Whether this was strictly true I cannot now consider.

But in the seventeenth century there was a manifest abatement, notwithstanding the occurrence of certain epidemics of almost unexampled severity. By the middle of the century there was a still greater decline, and in the third quarter the

disease had disappeared or was disappearing from the greater part of Western Europe. Eastern Europe continued to be subject to epidemics for a much longer period, and in the extreme East, Constantinople suffered almost up to our own times.

Looking at the broad facts of the prevalence of plague after the Black Death, we see then that there was a frequent recurrence of epidemics for about 300 years. At the end of that time, or in the middle of the seventeenth century, there was a general decline, and after that there was an unmistakable eastward recession, to which law there were only occasional exceptions, which might be compared to the sudden sparks thrown out from a slowly dying fire. Thus Ireland, the westernmost country of Europe, saw its last occurrence of plague in 1651 or 1652. London, as is well known, has not known the plague since 1666. Germany was nearly free at the end of the seventeenth century, but had recurrent epidemics at the beginning of the eighteenth. From this time on the eastward recession is so marked that the limits of successive epidemics may be denoted by the degree of east longitude to which they extended. Thus, in the first decade of the eighteenth century an epidemic is recorded which advanced through Germany and Scandinavia, but did not pass the tenth degree of east longitude. In forty years then, dating from the plague of London, there had been a recession of ten degrees of longitude. The next westward invasion, in 1719, was stopped at about twenty degrees east longitude in Poland. On several subsequent occasions in the eighteenth century the limit line passed through Galicia at about twenty-five degrees east longitude.

Russia, the Danubian Countries, and Turkey, continued to suffer, but at length in 1841 even Constantinople (twenty-nine degrees east longitude) saw the last of plague, and in 1845 it occurred for the last time in Egypt. To this law of eastward limitation there have been only two great exceptions, and one or two of trifling moment, viz. the great epidemic of plague in the South of France in 1720, and that in Sicily in 1743, while once in this century the disease found a temporary lodgment in Italy at Noja. But in all these cases the disease might reasonably be regarded as having been brought direct

from the Levant, and these advances were only the fluctuations of a definite retreat.

Since the middle of this century all the known seats of plague are, with one exception, far to the east,—Persia, Mesopotamia, the Himalayas, China, the only exception being the isolated seat of plague at Benghazi, in Africa.

Now, the general facts given in the above summary cannot be disputed. The history of plague in Europe from the fourteenth century may be compared to a great tidal wave coming in from the east, a period of high water lasting, though with a gradual decrease of the level, for three centuries, and a steady ebb, at first rapid, afterwards more gradual, for two centuries more.

And just as when we watch the tide ebbing a wave now and then of greater than usual force, or aided by some local advantage, will run in farther than the rest, so from time to time in France and Italy the general retreat has been broken by a temporary advance, but for all that the ebb has been in the main continuous.

It seems difficult to explain this in any other way than by supposing that the disease was one indigenous in the East, while in Europe, though nearly acclimatised for centuries, it has been always more or less of an exotic, and required fresh importations from time to time to keep up the stock. I know it is customary to attribute the decline of plague to sanitary improvements alone, supposing that it was formerly generated by the filth and misery of the poor in the Middle Ages. But if this were the sole cause the disease should have declined in proportion to the growth of cleanliness and prosperity, not according to geographical position. This, however, has not been precisely the case. Holland, for instance, accepted the gospel of cleanliness before England, but suffered from the plague even longer; and as I cannot but believe gave us the great plague of 1665. Again, let us consider the social condition of Ireland for many centuries. Here all the circumstances known to foster diseases such as plague, namely, poverty, want of cleanliness and so forth have been unfortunately much more conspicuous than in England, as is shown by the prevalence of the allied disease typhus. But Ireland got the plague later than England and lost it earlier, and, so far as I can trace,

suffered less severely in all the later epidemics; an advantage which can only be attributed to its geographical position, Dublin being about six degrees west of London.

Cleanliness and sanitary measures generally have been arms of priceless value in combating the plague, by making the soil unsuitable for the growth of the specific germ, but they cannot entirely explain its retreat. And another weapon with which plague has been combated is exclusion, or the means generally known as quarantine; the utility of which has also been very great, and of late years, I think, unjustly depreciated. But the true way of stating the case seems to be that with these two great weapons Europe has for centuries been combating an invasion from the East of an Asiatic disease.

Now, in order to test the truth of the assumption that plague has really been an Asiatic disease, let us see if we can still trace it in its Asiatic home, and if there are any facts which lead us to suppose that it is there an indigenous or endemic not an imported malady.

The facts of transmission in the fourteenth century clearly point to Central Asia as having been the source whence we derived the Black Death. In farther Asia there are at the present time, or have been quite recently, two seats of plague, without counting a nearer one in the highlands of Persia and Kurdistan. One seat is in certain parts on the southern slope of the Himalayas in Northern India. Another is in the south of China, in the province of Yunnan and at Pakhoi on the Tongkin Gulf.

Contemporary accounts of the Black Death all refer its origin to some country far in the East, and mostly to Cathay or China, though sometimes to India. Russian contemporary chronicles speak explicitly of the pestilence having first appeared in China. The Mussulman chronicles, which unmistakably record an epidemic contemporaneous with the European Black Death, derive it from the "Land of Darkness," by which they meant the unknown regions in the north of Asia. The Italian travellers speak positively of its prevalence in Tartary, and name also the Cathayans or Chinese as having been devastated by the pestilence.

All these reports mark out the line of advance, as having

been through Tartary, north of the Himalayas, and point to an origin still farther off in Eastern Tartary or China.

Now, the Chinese records confirm this to a certain extent. In the years 1333 to 1347 terrible inundations, such as we have quite recently heard of, produced famine in which four millions of men are said to have perished, and at least one great pestilence, credited with a mortality of five millions, is recorded. All calamities, both social and physical, seem to happen in that country on a stupendous scale.

It seems, therefore, not unreasonable to suppose that in these Chinese pestilences we have the starting-point of the great invasion of plague from the East, especially if we remember that the movement of population through Asia was always westward.

The only other hypothesis is that to which Professor Hirsch has given the authority of his great name :—That the great pandemic pestilence started from its home in Northern India. This is quite possible, and it may be doubtful to which theory we ought to give the preference.

The chief objection to the latter is that the wave of pestilence must either have crossed the Himalayas northward (which was not in the direction of the current of human intercourse), or else have traversed the plains of India ; which from their torrid climate are known to be inimical to, or even destructive of, the germs of plague, unable as these are to bear a tropical temperature.

Both the modern Chinese and the modern Himalayan plagues precisely agree in symptoms with the European plague of the Middle Ages, and have some features in common with that special outbreak called the Black Death.

In both places there is one remarkable feature. The plague seems to exist in the soil. When an epidemic is beginning, rats are seen to come out of their holes and die, while cats, dogs, cattle, and other animals are afterwards affected as well as men. This seems to show that one has tracked the plague to its original home in the earth. Whether this original home be India or China, it is startling to find the old historical disease existing in places, the distance of which from us in space is comparable to the interval of time which separates the present from the days of Edward III.

One other historical pestilence supplies us with an instance of a migratory epidemic which may still be found in its original home, namely, the celebrated SWEATING SICKNESS.

We read in the English histories that a terrible sickness broke out in or around the foreign army with which Henry of Richmond gained the victory of Bosworth Field, and soon afterwards passed to London, where it produced great mortality, causing the coronation of Henry VII to be put off, and ultimately spread all over the country producing great consternation.

To the doctors as well as to the people it was a new and unheard-of malady, as is shown by some of the quaint popular names which it received. From a parish register of later date is quoted the following entry: "The Sweat, called New Acquaintance, alias Stoupe Knave and Know thy Master! began the twenty-fourth day of the month." It disappeared after a few months, however, but occurred again on several occasions, once in the reign of Henry VII (1507), twice in the next reign (1517 and 1528), and finally once more when Edward VI was king in 1551. On this last occasion it was observed by John Caius, an English physician, who wrote the only medical description of the disease in this country which we have.

Three of these epidemics passed over to the Continent, two only as far as Calais and Flanders, but one of them, that of 1528, made the name of the English sweat terrible from the Alps almost to the North Cape. Hamburg was the point where it broke ground on the Continent, and a German ship returning from England was the carrier of contagion.

In a short time, with the same rapidity as that with which it had traversed England, it had passed southwards as far as Switzerland, northwards to all the Scandinavian countries, eastwards to Russia, and westwards into Holland and Flanders. France alone—and here we have a memorable exception—France alone of all the northern countries escaped. But the malady never spread south of the Alps.

I cannot, of course, dwell on the symptoms of this strange disease, but only notice one or two points; the remarkable perspirations which gave it its name; the extraordinary acuteness of the disease, which was often fatal in two or three

hours, and the rapidity with which it spread from one place to another, so that in each spot the visitation lasted only a short time, usually not more than a fortnight.

It was especially fatal to robust, free-living persons, not to the poor and weakly; in the words of Caius, "either to men of wealth, ease, and welfare, or of the poorer sort, such as were idle persons, good ale drinkers, and taverne-haunters."

Hence I suppose the nickname quoted just now, "Stoupe Knave and Know thy Master." Certainly many men of rank and note were among the victims.

Since the year 1551 the sweating sickness has been quite unknown in this country, and in its old terrible shape equally unknown on the Continent.

Are we then justified in saying that this historical pestilence, like the Black Death, still exists as a living disease in some part of the world? Undoubtedly a malady does exist which bears a very close resemblance to the old disease, though less severe. It is a native or indigenous disease in certain parts of France and of South Germany, and is known by the name of the sweat of Picardie, or in German Schweiss-Friesel.

Though not clearly distinguished till about 200 years ago, there can be little doubt that it prevailed there long before. More than 170 distinct outbreaks have been recorded, the latest of which took place only last year, in 1887.

What if this disease should have been prevalent in northern France when Richmond brought over his mercenaries, and if this should have been the starting-point of the terrible English sweat? This is probably the true statement of the case, though there are certain obvious difficulties which have to be faced. First, that the French soldiers whom we suppose to have brought the malady are not said to have been infected with any disease. But we have seen, in speaking of the Black Death, that those coming from an infected place may bring a disease which either they have never taken themselves or have had and recovered from. Next, why was the English epidemical disease so much more severe than the French indigenous disease?

Here it must be said that the differences between the two, which I do not discuss here, are differences of degree; and

on one occasion in South Germany a short outbreak of the modern disease presented symptoms precisely corresponding both in nature and severity to the historical English epidemic.

Moreover, it is a general law that when a specific disease is introduced among a population which has never been subject to it before, and which offers a virgin soil for its growth, it is more severe than in a country where it is at home, and where the population has become inured to the infection. Not many years ago a striking instance of this law was seen in the Fiji Islands, when European measles was introduced there, and spread with such rapidity and wrought such frightful destruction, that thousands perished from the attacks of the familiar and not much dreaded visitant of our nurseries.

Now, I suppose the French sweat to have been to the English people what measles was to the Fijians; it became a malignant pestilence instead of a common and comparatively mild disease.

Another remarkable fact in the history of the sweating sickness receives on the same theory a partial explanation, namely, that France itself, though supposed to have been the cradle of the disease, did not suffer when Northern Europe was ravaged by the epidemic of 1528. This would be due, on the view I am supposing, to the French people being inured to the disease in a milder form and thus protected. Germany and Scandinavia, on the other hand, were as little protected as England, and when they once received the infection suffered accordingly.

Time does not permit the further discussion of this interesting question. But if I am right we have here another instance of the intimate connection between the geography and the history of specific diseases. Here also we have a disease of historical interest presenting itself in modern times as a native indigenous disorder. These modern plagues are old foes with a new face, fortunately a somewhat less terrible one than they showed of yore.

APPENDIX.

As the foregoing lecture was intended chiefly for a non-medical audience, I did not enter into any particulars necessary to prove the identity of the ancient and modern diseases which are compared together. But as the recent outbreaks of the sweating disease in France have excited much interest, it may be worth while to place some contemporary notices of its nature and symptoms side by side with the account of the English sweating sickness, as described by John Caius.

The little tract on the disease written in English by the great Cambridge physician, has been reprinted by the Old Sydenham Society as a supplement to Dr. Babington's translation of Hecker's 'Epidemics of the Middle Ages.' His Latin treatise, 'De Ephemera Britannica,' is less known, but as it is more scientific than the other, being intended for the medical profession, and gives a much more precise account of the symptoms, I shall make a quotation from that as well.

In his English tract, 'A Counseill against the Sweate,' Caius gives a striking account of the suddenness and rapidity of the attack. "This disease," he says, "for the sudden sharpness and unwont cruelness, passed the pestilence. For this commonly giveth three or four, often seven, sometime nine, sometime fourteen days respect, to whom it vexeth. But that [the sweating sickness] immediately killed some in opening their windows, some in playing with children in their street doors, some in one hour, many in two it destroyed, and at the longest, to them that merrily dined, it gave a sorrowful supper. As it found them so it took them, some in sleep, some in wake, some in mirth, some in care, some fasting and some full, some busy and some idle, and in one house sometime three, sometime five, sometime seven, sometime eight, sometime more sometime all, of the which, if the half in every town escaped, it was thought great favour."

He maintains that it should be called, not the sweat merely, but ephemera, or a fever of one natural day. And of the symptoms of this fever he gives the following account:

"Quos ista (febris) invasit, istis modis torsit. Primo insultu aliis cervices aut scapulas, aliis crus aut brachium

occupavit. Aliis sensus erat veluti spiritus aut flatus calidi per membra ea discurrentis. Una cum his subitus et sine manifestâ causâ huic morbo insuetis largus sudor manavit. Interiora calebant primo, postea ardebant, calore jam inde ad extimas corporis partes diffuso. Sitis ingens, jactatio inquieta. Cor, jecur, atque stomachum male morbus habuit. Haec omnia subsecutus est gravis dolor capitis, vanum loquaxque delirium, post marcor, et inexpugnabilis pene dormiendi necessitas.

"Rursum, aliis, principio cohibitus sudor est, frigebant membra leviter; at postea erupit idem promotus, sed odore gravis, colore in alio alius pro humore ratione, quantitate subinde diminutus, subinde copiosus, substantiâ crassus. Aliis nausea, aliis vomitus erat, sed perpaucis, et pene solis ex cibo saturis. Omnes spiritum gravem et frequentem, vocem gemibundam expedivere. Urina colore tincta leviter, consistentia crassior, levamento ambigua, (nulla enim erat naturæ regula propter veneni impetum) caetera pro naturali. Pulsus, si quis prætentat, concitatior, frequentior. Haec certa morbi indicia erant.

"Quamobrem quibus sive his notis, sive mitioribus, sive asperioribus profluxit sudor (profluxit autem plurimis) id evenisse censeo non ratione morbi, sed ætatis, vestium, metus, vini, cibi, affectus animi, exercitii, temporis, (etenim vigebat maxime sub ardente Syrio ardoribus jam omnia obsidentibus) aut certe ratione differentis vel levis causæ. Nam quibus remissior fuerat aëris pestis, et ex corpore minor occasio ipsa quoque temperatior noxa erat, et nihil amplius quam corpus levi calore sudoreque blando tentabat."

La Suette Miliare in France.

To compare with these accounts of the old sweating sickness I will quote a description of the modern epidemic, as it was observed in certain districts of France in the years 1886–87. There have been many accounts of this epidemic, but it will be sufficient to quote one. I select, then, a very full description by M. Emile Parmentier of the epidemic of Suette Miliare in the canton of Lussac-les-Chateaux, a rural district in

the Department of Vienne, a part of the old province of Poictou.[1]

The population of the district was about 10,000, among which there 1200 cases of illness, and 130 deaths. In some places a quarter of the population was attacked, and 10 per cent. of the cases were fatal; but in others the proportion of cases, and the mortality were less.

The malady was evidently contagious, being carried from one village to another. It attacked all ages and all classes, but pregnant and suckling women were affected with special severity.

Symptoms.—In a few instances only were there any prodromal symptoms. In three fourths of the cases the onset was very sudden. The patient, who was quite well the day before, woke up in the night bathed in sweat, sometimes accompanied by shivers. Then followed oppression and palpitation.

The next day there were febrile symptoms,—white tongue, anorexia, the conjunctiva sometimes injected, and headache. The pulse was normal, or 80 to 90, the temperature 99·5° to 102° F., rarely higher, the urine scanty and high coloured, the skin bathed in perspiration. The chief complaint was of oppression, palpitation of the heart, and general weakness.

In the evening of the second day there was slight increase of fever, and the patient began to be anxious and agitated, till at 10 or 11 p.m. he became affected with a series of attacks of suffocation, as if an enormous weight pressed upon his chest and prevented his breathing. In severe cases the anxiety and feeling of impending death were terrible. The sweats continued to be abundant, but at daybreak there was an improvement.

During the next day the symptoms were the same, but with less severity. The urine became more and more scanty till it fell to 300 or 400 grammes daily. This was the history of the first three days.

Eruption.—On the night of the third or fourth day the patient felt tingling sensations at various parts of the body. The agitation and feeling of oppression became more intense, and the fever higher. These symptoms were the signal of

[1] 'Revue de Médecine,' Sept., 1887, p. 725.

the outbreak of the miliary eruption. Vesicles appeared first on the back and buttocks, next on the chest and forearms. The eruption was rarely complete at once, but usually appeared in two or three crops with an interval of twelve hours between each, and each was accompanied by fits of suffocation and renewed sweats.

The rash consisted either of clear vesicles, *white miliaria,* or vesicles surrounded by a red areola, *red miliaria,* or began with red spots like those of measles, afterwards becoming vesicular,—the *rubeolic* form. Sometimes all these were combined.

The other symptoms continued till about the sixth or seventh day, when there was some improvement. The sweats diminished, the respiratory troubles were less, the temperature declined, and the urine became more abundant. At the same time the liquid of the vesicles became turbid and milky.

From the tenth or twelfth day desquamation commenced, the epidermis being thrown off either in branny scales or in sheets.

From this time the sweats ceased or nearly so, the oppression on the chest disappeared, and all the other symptoms became ameliorated.

A critical polyuria took place generally on the second day of desquamation, the urine becoming increased up to two litres or more, and the urea in proportion. After this the patient became convalescent.

With regard to the sweats, it is noted that they were generally abundant, but not very excessive, unless, as was often the case, the patients were injudiciously buried in feather beds, and smothered up in blankets or quilts. The doctors had difficulty in combating the popular belief that the excessive sweating thus induced was beneficial. The fœtid odour of the perspiration sometimes observed was due entirely or chiefly to want of cleanliness.

The period of incubation was very variable,—from two to six or eight days after receiving the infection. The disease was certainly not caused by malarial poisoning, but was clearly transmissible by direct contagion. Indirect contagion, by means of clothes and other objects was also recognised, and even an infection of the soil was thought possible. The

infection from dead bodies was thought to have a special potency.

The question whether the modern French is the same as the old English disease is one on which the reader may be left to form his own opinion. I will only say that on comparing the above description with that given by Caius of the English sweat, it seems to me evident that there is a great general resemblance, but with at least two points of difference, viz. the longer duration of the modern as compared with the old disease, and the presence of a miliary eruption, which is not described in connection with the historical sweating sickness. It seems, perhaps, not quite impossible that this may have escaped the less minute observation of the sixteenth century, or, on the other hand, it may have been absent on account of the short and rapid course of the old disease.

A more precise parallel with the English sweat is presented by a singular isolated epidemic which broke out at Röttingen, a small town of Franconia in Germany, in November, 1802, and lasted for ten days only, having never been observed there before or since.

The following account of the disease by an eye-witness is quoted in Hecker's 'Epidemics of the Middle Ages:'[1] "Strong, vigorous young men were suddenly seized with unspeakable dread; the heart became agitated and beat violently against the ribs, a profuse, sour, ill-smelling perspiration broke out over the whole body, and at the same time they experienced a lacerating pain in the nape of the neck, as if a violent rheumatic fever had taken possession of the tendinous tissues. This pain ceased sometimes very quickly, and if it then shifted to the chest the distressing palpitation of the heart recommenced, a spasmodic trembling of the whole body ensued, the sufferers fainted, their limbs became rigid, and thus they breathed their last. In most cases all this occurred within four and twenty hours. They did not all, however, succumb under the first attack, but as soon as the

[1] Babington's translation, 3rd edition, 1859, p. 301.

accelerated pulse had sunk to the lowest ebb of smallness and feebleness, a corresponding effect being observable in the respiration, the violent pain would in some cases return to the outward parts. The patient then felt a benumbing pressure and stiffness in the nape of the neck, and the pulse and respiration became restored again as in health, but the perspiration continued to pour incessantly down the skin.

"This apparent safety was, however, very deceptive, for a renewed palpitation of the heart unexpectedly commenced, accompanied by a feeble pulse, and then death was often inevitable. It was remarkable that the patients, though bathed in perspiration, had very little thirst, and the tongue was not dry, nor ever even foul, but retained its natural moisture. With most, however, the urine was scanty, as the skin, under the increasing debility, permitted too much fluid to stream through its pores. If the disease passed off without heating sudorifics then, in general, no eruption made its appearance. The malady then continued till the sixth day, but on the first only did it display its malignant symptoms, for by the second the sweating diminished and lost every unfavorable quality, so that increased transpiration of the skin, without any other symptoms of importance, alone remained, and on the sixth day the patient was perfectly restored."

This Röttingen sweating sickness seems to have been nothing else than the English sweat over again, but how it came to break out suddenly after a sleep of nearly 300 years, and then as suddenly to pass into oblivion again, are questions to which no answer can be given.[1]

[1] For further information on the subject of this lecture I may refer to my articles on "Plague" and "Sweating Sickness" in the 'Encyclopædia Britannica.'

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