So far in this series I've argued for a view of disease that sees it as rooted in human society and behaviour and not as a factor impacting on them from outside. The Black Death was spread to Europe by changing patterns of trade, by warfare, conquest, and empire. The Great Pox was brought across from the Americas by Christopher Columbus, and spread through sexual contact, initially at least through warfare and the troop movements across large distances that it frequently involved. But an even clearer example is provided by the third in my list of the great plagues, namely tuberculosis. Like all the most widespread and devastating diseases, it had a common name: the white plague or the white death.

Tuberculosis as it’s understood today is caused by an organism known as mycobacterium tuberculosis. It typically affects the lungs, and is spread by coughing, sneezing and spitting, or in other words droplet infection – it’s been calculated that a single ordinary sneeze, for example, expels around 40,000 droplets into the air. In about ten per cent of cases, symptoms develop, including a chronic, hacking cough, often mixed with blood; night sweats and fever; and progressive loss of weight – hence the use of another term for the disease, consumption, since the body seems to be consumed from within. About 50 per cent of cases where symptoms develop are fatal. Small growths known as tubercles affect the lungs, causing tissue damage and reducing their ability to process oxygen. In a small proportion of cases the disease can also affect the central nervous system, or the bones and joints. If the bacteria enter the bloodstream through damaged tissue they can spread throughout the body in what is known as miliary tuberculosis, which is particularly common among young children and fatal in almost a third of all cases.

They can affect the lymphatic system, causing a swelling of the glands on the neck known as Scrofula – this was commonly known as the King’s Evil and since the Middle Ages was supposedly cured by the royal touch in a symbolic demonstration of the monarch’s sacred power, as in this illustration of 600 subjects who have traveled far and wide to be touched by Henri IV of France. Shakespeare’s Macbeth has a passage noting the Scottish king’s use of the royal touch:

...strangely-visited people  
All swoll’n and ulcerous, pitiful to the eye,  
The mere despair of surgery, he cures,  
Hanging a golden stamp about their necks,  
Put on with holy prayers; and ’tis spoken,  
To the succeeding royalty he leaves  
The healing benediction

It didn’t do him much good in the end. In real life, King Charles II continued the custom, and famously Dr Samuel Johnson, compiler of the first functional English dictionary, was touched for scrofula by Queen Anne in his youth; the custom was revived in the 1820s by the reactionary French monarch Charles X, though it did not help preserve him from being dethroned in the revolution of 1830s.

Tuberculosis or TB as I’ll call it for short has been around for a long time. It’s often difficult to identify it from written descriptions since many forms of ‘consumption’ and related symptoms can be caused by other diseases, such as lung cancer. There are also different forms of TB, some of them affecting animals. But modern analytical techniques have found it in Egyptian mummies and in prehistoric skeletons dating back to 4,000 BC. It’s likely it was transmitted to humans during the so-called Neolithic Revolution, when humans first began farming land and domesticating animals. The Greek medical scientist Hippocrates and his followers identified it as phthisis in the mid-fifth century BC, describing symptoms including coughing blood and wasting away; they regarded it as almost invariably fatal. Yet despite this long history, TB only really became widespread in Europe in the late eighteenth and early nineteenth centuries. Already in 1799 Thomas Beddoes declared that consumption was the greatest cause of death in Britain, and in 1815 Thomas Young estimated that it was ‘a disease so frequent as to carry off prematurely about one-fourth part of the inhabitants of Europe’. Around 10 to 13 per cent of the white prisoners in the three leading American penitentiaries died of consumption between 1829 and 1845 (nobody seems to have bothered with the black ones). 250 out of 696 autopsies performed in the main Paris hospital in the early 19th century reached a diagnosis of TB as the cause of death. 53 per cent of the children in a Berlin orphanage were diagnosed with scrofula in the 1840s and all 78 boys and 91 of the 94 girls in a workhouse in the English county of Kent in 1844 were also said to have shown signs of the disease. Consumption became almost a staple part of nineteenth-century culture.

It’s from this period indeed that most literary representations of the disease come. It began, perhaps, with the poet John Keats, sketched here on his deathbed by his friend Joseph Severn. ‘Youth’, he wrote in 1819, ‘grows pale, and spectre thin, and dies’, as indeed he did, of consumption, two years later. The autopsy revealed his lungs to be almost entirely destroyed by the disease. The relatively mild outward symptoms of TB, which lacked the repulsive qualities of those of many other diseases such as, for example, the bubonic plague; the generally slow progress of the disease, so unlike the sudden death brought by so many epidemics; the lack of any link to immoral conduct, as in for example syphilis; - all made consumption seem almost ennobling. This allowed...
sufferers and observers alike to deny the reality of the disease, to speak of it in euphemisms and circumlocutions. Milly Theale in Henry James’s *The Wings of the Dove* just ‘turned her face to the wall’, the details of her death aren’t described at all. People avoided mentioning in public the grosser symptoms of TB, like the stinking breath of the consumptive that produced, as the Goncourt brothers wrote in their journal of a visit to their friend Henri Murger, ‘the odour of rotting flesh in his bedroom’.

Consumption was an ideal subject for romantic literature, associated with melancholy and a lack of the will to live on the one hand, and creativity and desire on the other. The brothers Goncourt declared in *Renée Mauperin* in 1864 that in contrast to the diseases of a cruder and baser kind which clog and soil the mind, the imagination, and the humours of the sick, phthisis is an illness of the lofty and noble parts: it calls forth a state of elevation, tenderness and love, a new urge to see the good, the beautiful and the ideal in everything, a state of sublimity which seems almost not to be of this earth.

They described it as a kind of ‘progressive disembodiment’ in terms echoed by Charles Dickens, who describes in *Nicholas Nickleby* a dread disease which so prepares its victim, as it were, for death, which so refines it of its grosser aspect…in which the struggle between body and soul is so gradual, quiet, and solemn, and the result so sure, that day by day, and grain by grain, the mortal part wastes and withers away, so that the spirit grows light and sanguine with its lightening load…

Edgar Allan Poe portrayed with fascination his young wife, dressed in white, ‘delicately, morbidly angelic’, as he put it in 1842, singing and playing the harp: ‘Suddenly she stopped, clutched her throat and a wave of crimson blood ran down her breast…It rendered her even more ethereal’; he saw in this incident, he wrote, ‘the terrible beauty of consumption.’

TB did indeed hit the young adult population hardest. In the second half of the nineteenth century, almost half of all recorded deaths in the age group 20-24 in England and Wales were from consumption. Its effects rendered young women even more weak and helpless in the eyes of Romantic novelists than convention already supposed them to be.

Consumptive women, like the Goncourts’ Renée Mauperin, were unable to take any kind of physical exercise, and indeed were frequently subject to fainting fits. It added a touch of the tragic, supposedly increasing sexual desire while dooming love to extinction. One of the era’s most popular plays, *The Lady of the Camellias*, by Alexandre Dumas the younger, was based on the short life of the author’s former lover, who died of TB at the age of 23, not before becoming a celebrity in the social world of Paris in the 1840s; the public sale of her belongings after her death in 1847 attracted large crowds, including Charles Dickens, who commented that one might have thought she was Joan of Arc, so extreme and so general was the public outpouring of grief. The play was translated into English and became a hit on Broadway, and was used by Verdi as the basis for his successful opera *La Traviata*. TB became almost fashionable. ‘I look pale’, Lord Byron is said to have remarked, gazing into the mirror during a visit by the diarist Tom Moore: ‘I should like to die of a consumption.’ ‘Why?’ his guest asked. ‘Because the ladies would all say: Look at that poor Byron, how interesting he looks in dying!’

Consumption was widely regarded as intensifying the sufferer’s experience of life, and therefore adding intensity to the creative artist’s output, at least until it became so severe that mental and physical activity was no longer possible except for very short periods. The compose Frédéric Chopin, whose health was euphemistically described as ‘extremely delicate’, continued to write music during his last years, as one of his pupils later wrote, improvising at the piano and ‘transporting us to regions none of us had known before and none of us would revisit again’, before his death from TB in 1849.

Searching for a healthy climate, Robert Louis Stevenson travelled across France and America and the Pacific, in search of a healthy climate, producing evocative travel writing and novels and stories set in exotic locations before he died in 1894. In fiction, the character of Ralph Touchett, in Henry James’s *Portrait of a Lady*, a young man who is ill with consumption throughout the novel, has been rendered selfless as well as sensitive and perceptive by his disease and the knowledge that he will die of it before reaching middle age; in a sense the disease has made him morally superior to many of the other male characters in the book.

And yet, the moral elevation that many writers and commentators saw as a by-product of consumption belied the fact that it was a disease above all spread by overcrowded homes, unhealthy working conditions and poor nutrition; it was in other words not a disease primarily of well-off artists, intellectuals and socialites, it was a disease of the poor. The Russian novelist Fyodor Dostoevsky, with his brutally realistic view of Russian society, saw this clearly enough. There are few more terrifying scenes in literature than the death of the consumptive, poverty-stricken widow Katerina Ivanova, thrown into poverty by the alcoholism of her irresponsible husband and even more so by his eventual death; in delirium and desperation, she takes her small children out onto the streets to sing and dance for a few kopecks; arrested by a policeman she runs breathlessly away, stumbles and falls dead in the street, blood gushing out of her throat: ‘I’ve seen it before’, says the policeman, ‘That’s consumption.’ Her death is undignified and grotesque, the product of extreme poverty that has driven her not into an exalted state of mind but to madness and degradation.

Poverty appears as a cause of TB relatively seldom in literary and artistic representations of the disease. Perhaps the most famous example is Puccini’s opera *La Bohème*, first performed in 1896 but based on a novel from 1846, in turn based on the real experiences of its author, Henri Murger. The novel, really a loosely connected set
of stories, called *Scènes de la vie bohème*, quickly turned into a popular play. Murger, an impoverished writer, fell in love with a flower-girl, Mimi, who was already suffering from tuberculosis and indeed died a year after she moved in with him. All of the characters in the stories are poor; some of them belong to a group calling itself the water-drinkers because they are too poor to afford wine; a number of them suffer from TB, such as Francine, ‘pale like the angel of phthisis’, who simply falls asleep one evening and does not wake up; and some even envy sufferers of the disease, including the pianist Schaunard, who assures a potential patron that ‘I would be as famous as the sun if I had a black suit, wore long hair, and if one of my lungs was diseased’. Murger himself, as I’ve already noted, was tubercular and died of the disease in 1861 at the age of 39. But the characters in his book, as in the play and the opera, are poor by choice, and the life they live is one of idleness and pleasure; at the end, they decide to return to conventional bourgeois life. Such an option was not open to the vast majority of TB sufferers in the nineteenth century.

The reason why tuberculosis was a classic disease of the nineteenth-century and the poor despite the fact that it had been around for millennia can be found above all in the effects of industrialization and urbanization on European and American society. Factories and home fires fuelled by coal that was anything but smokeless generated massive atmospheric pollution. As the towns and cities of Europe expanded with headlong rapidity, and new industries, coal, iron and steel, engineering, textiles, sprang up, turning villages into towns and towns into cities, as coal became cheaper and wood more scarce, so chimneys of all kinds belched increasing quantities of smoke and soot into the atmosphere over every major urban centre. The London fog of the Victorian era became almost synonymous with the city, and artists like Claude Monet actually traveled to the British capital to paint it. ‘The masses of smoke that are permanently situated over our cities’, reported a German committee of inquiry in 1899, ‘encourage the creation of dirty fog’, and indeed the average number of foggy days recorded every year in Munich rose from 59 between 1877 and 1895 to 80 from 1895 to 1905. So great was the quantity of soot and smoke in the atmosphere that people living in poor districts near to factories kept their windows permanently shut, helping to spread droplet infection within the home: in factories, heat and dust and poor ventilation had a similar effect. As these maps show, the death rate from TB in Germany was highest in the industrial region of the Ruhr, on the western side, and also high in the industrial Rhineland around Cologne, in Franconia around the textile centres of Nuremberg and Fürth, and in the coalmining areas of Silesia.

TB hit the poorest most because the poor lived and worked in the most overcrowded, damp and unhealthy conditions. In the nineteenth century TB could be spread by infected milk, and the poor in the big cities were unable to buy fresh and healthy food or keep it for long in an age before refrigeration. There were no regulations to prevent the adulteration of foodstuffs with harmful additives, as here in this 1858 Punch cartoon of a lozenge-maker. The wealthy by contrast were better fed and lived and worked in light, airy and roomy conditions. In late nineteenth-century Hamburg, there is a clear negative correlation between the average income of the inhabitants of a city precinct and the average annual death-rate from TB. The two richest districts, to the west of the Alster lake that occupies the centre of the conurbation, had the lowest death rates from consumption, while the highest death rate of all was in the Neustadt Süd, adjoining the river Elbe, which was one of the four poorest precincts. In the late 1890s the average annual mortality from consumption stood at 6.6 per thousand taxpayers earning between 900 and 1200 Marks a year, and 1.9 per thousand for those earning over 10,000 Marks a year. In the poor districts, TB mortality increased as more and more cheap housing blocks were constructed – in the Hamburg district of Winterhude, for example, it rose by 22 per cent between 1885 and 1895 as the eastern part of the precinct was filled up with large and overcrowded ‘rent barrack’, Mietskasernen, as they were called, for the working class.

The well-off, naturally, had much easier access to treatment for the disease in an age before universal health insurance and the welfare state. There were of course many different opinions on what was the best cure. The eighteenth-century physician Thomas Beddoes considered over-exertion of the lungs to be a cause, and thought that players of wind instruments were particularly prone to the disease. Half a century later, however, the Belgian Adolphe Sax recommended playing wind instruments to strengthen the lungs, not surprisingly perhaps, since he had invented one, namely the saxophone, as seen here in this satirical cartoon, and was keen to promote its therapeutic qualities. Some doctors recommended a starvation diet against the fever that was one symptom of the disease, others told their patients to eat plenty of lobster, a remedy only the wealthy of course could follow. In the later seventeenth century the royal physician Gideon Harvey poured scorn on the popular belief that drinking donkey’s milk could get rid of consumption, asking whether ‘Ass-Patient or Ass-Doctor was the greater Ass’. He himself proffered a syrup thought to have contained ground-up millipedes. Many patients alleviated their suffering by consuming opium in one form or another to dampen the coughing. Other doctors tried collapsing and reinflating the lungs, surgically removing affected body parts, or getting patients to inhale gases of various kinds to purify the lungs.

The most popular treatment of all was through providing fresh air, a dry and pure atmosphere, a healthy diet and rest for body and spirit, by moving to milder southern climates or to the seaside or to high mountainous regions. There’s no doubt this treatment did at least some good, given the way in which TB was spread but of course these treatments were available only for the well-off or at least they were not available to the working classes. Sufferers like Robert Louis Stevenson or Frédéric Chopin could travel in search of the sun; a miserably poor tubercular widow in St Petersburg could not. Here from the 1860s onwards in Europe, followed from the 1880s in America, enterprise doctors established sanatoria, as here in a photo of a ‘Cure Cottage’ at the Adirondack Cottage Sanatorium. Patients were made to rest, given a solid diet, and plenty of fresh air, though none of this, illustrated here as patients are wheeled out to enjoy the open air in the well-ventilated solarium at
the Waverley Hills Sanatorium, guaranteed survival; one estimate puts the number of patients who died at this Arkansas centre, first opened in 1910, at 64,000 up to the end of the Second World War.

The most famous sanatorium in literature was of course Thomas Mann’s *Magic Mountain*, published in 1924, which takes advantage of the fact that a sanatorium houses a group of patients all facing death and thus forced to reflect on their lives, confined together for a lengthy period of time. Typically for literary treatments of TB, Mann sees the experience of prolonged and dangerous sickness as the key to a transition to a higher, more mature form of awareness, rather than as something negative, squalid or emotionally debilitating. Enforced idleness enables the characters to debate fundamental issues of the meaning and purpose of life, politics, duty, love, belief and much else besides. There’s no doubting the bourgeois nature of the characters, or the paradoxical luxury of their Spartan surroundings. Mann conceived the idea of the novel while visiting his tubercular wife Katia at the Woodland Sanatorium in Davos, in the Swiss Alps, shown in this book cover, and she was indeed cured. The basic idea of the sanatorium was sensible enough; the problem was just that very few could afford it, though with the spread of health insurance in the first half of the twentieth century its benefits began to be extended beyond the upper and middle classes.

By this time, however, the incidence of TB had been falling for many decades. Despite continuing urbanization and industrialization the trend was steadily downwards. Just how rapidly it went down depended very much on the location, however. Broad, global statistics could often conceal widespread variations from place to place. In three major New England towns for example, the death rate from TB actually rose for a couple of decades just after the middle of the twentieth century, and in Manchester it only began to decline in the 1880s. In Hamburg the death rate did not begin to fall until the middle of the 1850s, but growing overcrowding in some parts of the city caused it to level off between 1860 and the late 1880s before falling again, and I’ve already mentioned the sharp increase in at least one of the city precincts at this time.

What caused these fluctuations? Direct medical intervention, as with almost all nineteenth-century diseases, had little or no effect. Sanatoria were used by too few people to have a measurable statistical impact. Better housing doesn’t seem to have had much of an effect. TB death rates in England and Wales fell at a time when relatively little improvement in this field could be observed. It would have required a vastly greater improvement in housing quality and a much bigger reduction in overcrowding to reduce the incidence of the disease significantly, although it is possible that the beginning of a trend towards a lower birth rate and smaller families in the late nineteenth century might have contributed to the decline. The most important factor is likely to have been improved diet. The crucial point to note here is that in the nineteenth century almost everybody had TB. In 1930, when accurate testing had become possible, a survey of European cities showed that 20 per cent of children had been infected by the age of 2; half by the age of 5; and 90 per cent by the time they were fifteen. Only three per cent of adults showed a negative reaction to the standard test for the presence of the disease. Whether or not symptoms developed depended partly on how frequently and intensively a victim was infected, but most of all it depended on the victim’s diet. There’s no doubt that diet got worse in the process of early industrialization and urbanization, but it’s equally clear that from the 1880s, chemical methods of testing food, particularly for harmful additives, became effective, and one state after another introduced regulations governing food hygiene and food quality; equally, after an initial dip, living standards slowly began to improve in the industrial world, and workers began to be able to afford a better diet, which in turn made them more resistant to the most harmful effects of TB. An illustration of the connection can be found in a sharp but temporary rise in TB deaths in Denmark during the First World War, between 1915 and 1917, when huge quantities of meat and dairy products were exported to the UK and national consumption slumped. Protein intake seemed to be an important factor in strengthening resistance to the disease.

By this time, too, the discovery of the causes and means of transmission of the disease had also begun to have an effect, though initially far more in terms of prevention than in terms of finding a cure. Technological advances in the production of microscopes and aniline dyes provided the basis for the great age of bacteriological discovery in the second half of the nineteenth century, and the breakthrough in the case of TB was made by the German doctor Robert Koch, who had discovered the cause and mode of transmission of anthrax in 1870 and followed this with further work, under the aegis of the Imperial Health Office, which provided him with a well-equipped laboratory in Berlin. In 1882 he succeeded in demonstrating through the use of differential chemical staining of microscopic samples the presence of the tuberculosis bacillus in all the sufferers he investigated, and managed to cultivate the bacilli in his lab and show their effect by injecting them into healthy animals, producing within a short time the classic symptoms of the disease. Koch repeated these experiments on a large scale until his discovery became indisputable. It was a major achievement and made him famous across the world.

But in 1890 Koch went further and announced he had discovered a new treatment for the disease: tuberculin, a glycerine extract of tuberle bacilli called *tuberculin* which was hailed worldwide as a miracle. Sufferers, it was reported in an English magazine, were ‘stampeding for dear life to the capital of Germany. The dying have hurried thither, sometimes to expire in the railway train, but buoyed up for a time by a new, potent hope’. Arthur Conan Doyle, still practising medicine and medical journalism though already famous as a novelist and short-story writer, rushed to Berlin to investigate, and began to have doubts. He noted that the media hype was unjustified; tuberculin did not kill the bacilli, and indeed Koch had never made such a claim; all it did was temporarily suppress some of the symptoms. Worse was to follow, as it became clear that the treatment was fatal to some patients and killed more than it cured. Critics claimed that Koch and even more his assistants had...
been rushed into making premature and exaggerated claims for tuberculin by a German government anxious to boost his reputation over that of his French rival Louis Pasteur, and the same government now stepped in to rescue him from the débacle, suppressing newspaper criticism and showering him with numerous honours and awards for his many other discoveries. Indeed he was eventually awarded the Nobel Prize for Medicine. And as it turned out, tuberculin may not have been useful in curing the disease, but it was an effective tool in diagnosing it, aided immeasurably by the invention of x-rays by Wilhelm Röntgen in 1895. Soon health authorities were urging people to undergo x-ray investigation to establish whether or not they were suffering from TB, even if they showed no symptoms.

Moreover, after Koch’s discovery of the causative agent of TB, public health authorities could begin to take more effective measures against its transmission. The knowledge that it was spread by germs made it clear that coughing and spitting spread TB through droplet infection, and soon governments were issuing warnings to people to cover their mouths when coughing and avoid spitting in public places. Nevertheless, such measures were slow to take effect. TB still caused a sixth of all deaths in France at the end of the First World War and was still a major killer in other European countries. Governments of the interwar years launched new crusades for public health, targeting TB in particular, which rendered so many young men unfit for military service. Voluntary public health associations mounted nationwide campaigns against the disease. They raised money by selling Christmas seals, which netted no less than $20 million for anti-TB associations in 1950. As one of those involved in these campaigns later wrote, more dramatic methods were used too:

Some of us can still remember the empty-corner-beer-saloon tuberculosis exhibit, with its tuberculous and anthracotic lungs preserved in formaldehyde; with its jars of colored beads, each bead representing a soul victimized by tuberculosis; with its large painted skeletons depicting graphically the numbers annually dead of tuberculosis in the United States; with its flashing lights, each flash signalling the entrance of another soul into eternity via tuberculosis.

As in other areas, the New Deal in the USA played a particularly prominent role here, both nationally and at a regional and local level. In France, special days were held to urge people to remember war veterans now plunged into poverty and suffering from the effects of TB.

By this time, effective immunization against the disease was starting to become available. Koch did not think that bovine TB and human TB were related, but the French scientists Albert Calmette and Camille Guérin used a diluted strain of bovine TB in 1906 to create a vaccine known as Bacillus of Calmette and Guérin or BCG, first used on human subjects in France in 1921. Establishing the connection between the two diseases also boosted the spread of the practice of heating then rapidly cooling milk, known as pasteurization since its development by Koch’s great rival in 1882. Acceptance of the vaccine was seriously damaged, however, by a major disaster in the north German city of Lübeck in 1930, when 256 new-born infants were immunized with a sample of BCG that turned out to have been contaminated by a virulent strain of the disease; 77 of them died and another 131 were seriously ill before recovering. Local authorities were accused of trying to hush things up, as in this cartoon – ‘the worst mistake in the whole affair was that something like this could reach the public!’ – and those responsible were brought before the courts and found guilty of manslaughter in a massively publicized trial. The scandal aroused widespread hostility to the medical profession, as in this cartoon, where the Lübeck doctors are reassuring themselves: ‘Despite the disaster it’s a consolation that the children we’ve treated will never fall into the hands of unqualified quacks!’ As a result, BCG was not widely used outside France until after 1945, and resistance to vaccination in Germany was still strong in the 1950s. By this time, however, antibiotics were coming into use, with streptomycin proving an effective way of eliminating the tubercle bacillus and bringing about a complete cure.

TB infection and death rates thus began to plummet from the 1950s far more steeply than they had done in the preceding decades. The stepping down of the disease was starting to become available. Koch did not think that bovine TB and human TB were related, but the French scientists Albert Calmette and Camille Guérin used a diluted strain of bovine TB in 1906 to create a vaccine known as Bacillus of Calmette and Guérin or BCG, first used on human subjects in France in 1921. Establishing the connection between the two diseases also boosted the spread of the practice of heating then rapidly cooling milk, known as pasteurization since its development by Koch’s great rival in 1882. Acceptance of the vaccine was seriously damaged, however, by a major disaster in the north German city of Lübeck in 1930, when 256 new-born infants were immunized with a sample of BCG that turned out to have been contaminated by a virulent strain of the disease; 77 of them died and another 131 were seriously ill before recovering. Local authorities were accused of trying to hush things up, as in this cartoon – ‘the worst mistake in the whole affair was that something like this could reach the public!’ – and those responsible were brought before the courts and found guilty of manslaughter in a massively publicized trial. The scandal aroused widespread hostility to the medical profession, as in this cartoon, where the Lübeck doctors are reassuring themselves: ‘Despite the disaster it’s a consolation that the children we’ve treated will never fall into the hands of unqualified quacks!’ As a result, BCG was not widely used outside France until after 1945, and resistance to vaccination in Germany was still strong in the 1950s. By this time, however, antibiotics were coming into use, with streptomycin proving an effective way of eliminating the tubercle bacillus and bringing about a complete cure.

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Nevertheless, this is not the end of the story. Two developments in the late twentieth century gave it a new twist. The first of these was the rapid spread, particularly in the developing world, of HIV infection, which reduced resistance to TB, one of the major opportunistic diseases that affects sufferers. And the second is the alarming emergence of new strains of the bacillus that are resistant to treatment with antibiotics. In developing countries in particular, vaccination programmes are often difficult to carry out, and long-term treatment with effective antibiotics is often impossible. Worldwide the number of reported cases began to climb again. In 2010 there were an estimated 8.8 million new cases, and one and a half million deaths (0.35 million of them associated with HIV). In many African and Asian countries up to 80 per cent of the population come out positive in the tuberculin test, compared to under 10 per cent in the USA. Poverty and malnutrition play a major role in the development of symptoms. The global incidence of TB has been declining since 2005, but this is largely due to effective measures taken in China, where anti-TB campaigns have been running since the 1920s but have only become really effective as the government has implemented comprehensive vaccination and treatment programmes; as a result, in the 20 years to 2010 there was an 80 per cent reduction in TB mortality in China.
In India, by contrast, there were 2 million new cases registered in 2007 and the disease has been on the increase, as you can see from the top-right-hand graph here, although one might speculate that some of the rising statistical curve is an effect of better reporting. Education programmes have been in place for some years, often targeting the young who, it is assumed, are better educated than their parents; here it’s the child who’s taught how the disease can be combated and who is made responsible for administering the treatment to her mother. ‘Deepa makes sure I take the pills at the same time every day’, she announces proudly, pointing to the board on which her daughter crosses off the daily dose. Education is as important here as in any other area of health care and disease prevention. What all this suggests is, as in the nineteenth century, it’s poor living and working conditions, malnutrition, poor education and above all general poverty that are the major factors in weakening people’s resistance to the disease. Treatments and preventive measures are available but they depend on an effective and well resourced public health administration if they are to reach everybody.

All this can be read off from the 2010 World Health Organization map of TB and its incidence. The highest rates of reported new cases per 100,000 population, marked dark green on the map, are to be found in sub-Saharan Africa and parts of West Africa, where either HIV/AIDS is prevalent, as for example in South Africa or Swaziland, for reasons I’ll explore in the last lecture in this series, or the state is weak, civil war and conflict are rampant, or poverty is endemic, as for example in the Democratic Republic of Congo, or where geographical remoteness of many populations and difficulty of access combined with widespread poverty make prevention and treatment difficult as in Papua New Guinea. TB has not gone away, therefore. Worldwide TB is still the second most common cause of death from infectious disease after HIV/AIDS. In Liberia following major civil conflict the infection rate is 288 per 100,000, in Sierra Leone, even worse affected in this regard, 645; in poverty-stricken Bangladesh 215, in AIDS-affected Namibia 693, South Africa 971, Swaziland 1,257. By contrast, the infection rate in the UK is 13, in France 9 per 100,000.

TB, the White Death, has long lost its cultural associations in Europe and North America, where it’s now almost indelibly linked to the literature, culture and art of the Victorian era. Its generally rather undramatic symptoms and its slow progress enabled it to be represented in romantic and euphemistic terms, as I’ve suggested, coining a variety of literary representations memorably criticized in Susan Sontag’s essay *Illness as Metaphor*. At the same time it blighted millions of lives and caused huge personal despair and grief. It was after his wife and mother died of tuberculosis that Edvard Munch painted his best-known work *The Scream*, in which the figure on the bridge itself appears as emaciated, black-clad, and tubercular. Yet the levels of shock and grief caused by TB were less than those occasioned by the disease I’ll be discussing in my next lecture, perhaps the most shocking of all to the nineteenth-century European and American sensibility: cholera, the great leveller, the terrifying and disturbing invader from the East.

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