Three diseases which, like malaria and yellow fever, had to wait for the end of the nineteenth century for their suppression, were the alimentary troubles. Of these, dysentery and typhoid fever probably date from the early years of the Christian era. Cholera burst out of India in the early 1820s and is, par excellence, an urban disease of the nineteenth century. All three diseases cycle from human to human, via the drinking water and sewage systems or, more intimately, from unwashed hand to food to mouth. Typhoid and dysentery have different symptoms, yet historically, it is difficult to distinguish between the two. Typhoid results in diarrhoea, and fever, and general debility. But the organism affects all the organs, and may live on for years, especially in women.38 Typhoid fever organisms survive in water, but do not multiply therein. They live in warm air long enough to infect people downwind of the excreta of the diseased. The organism prefers acid conditions, of the pH of a normal stomach. So alkaline soils, water and cold conditions deter mass infection. Typhoid was always known as a warm weather disease, or of the tropics. It took a long time for people to realize that the active organism was inhibited by cold, but multiplied in balmy weather. Typhoid was a great killer of people in cities and in armies. As late as the Boer War (1899-1902) the British lost twice as many men from typhoid as from all battle casualties, and ten times as many as were killed outright by the enemy. It was this kind of loss of life which made warfare so expensive in manpower.

Dysentery was also a great killer. In the Crimean War (1854-7) British deaths from dysentery were ten times those from all killed in enemy action. But dysentery, unlike typhoid, is not carried especially by women.39 It was originally known in England as 'the bloody flux' since the stomach evacuates everything, then starts to discharge skin, flesh, and blood. Ultimately the unlucky patient dies, as often as not in great pain, of internal haemorrhage, passing stinking matter of a peculiarly nauseous and unique nature. Old-time doctors could smell the difference between typhoid and dysentery a hundred yards away from a sufferer.

Typhoid was prevented by the injection of dead organisms in a vaccine, the process being regularized in most armies before 1939.40 Dysentery another matter, needing constant care and hygiene to prevent the problem. The prevention is still the same sort of hygiene and sanitation that wise people have practiced for centuries. Dysentery is spread by flies, contact with infected people or feces, and by birds and other animals. Of the two causative factors, the bacillus which causes one sort of dysentery can be killed by the sulfa drugs. Amoebic dysentery, on the other hand, is a subacute, chronic, recurring form of the disease and may persist for years, like malaria; the parasite can cause serious liver problems if untreated. For years, the solution was a derivative of the Brazilian plant ipecacuahana. This contains the alkaloid emetine which, combined with opium, was made up as Dover's Powder, without which no Victorian traveller was properly prepared for the rigours of abroad. It is specific against amoebic dysentery, but it was more widely used. This convenient drug was used for every kind of upset, from diarrhoea, however caused, through Gippy tummy to Montezuma's revenge. Probably the mild dose of narcotic did as much to comfort the voyager as did ignorance of the true nature of the trouble.

Cholera was another matter, because it was a 'new' disease for the European. Like typhoid and some sorts of dysentery, cholera gives rise to fever. Unlike any previous 'civilized' disease, it sprang upon the world at a time when its symptoms were fully noted. It has had a short career in the Western World, as diseases go. Cholera, or some other fever answering the description given by later writers, had been cycling and recycling in the Far East for centuries. A particularly bad outbreak occurred in Bengal, India, in 1816-17. Cholera, unlike dysentery and typhoid, is very rapid. Very often the disease reached the acute stage within twenty-four hours, and has been known to kill within another day.

Unlike typhoid, cholera prefers alkaline conditions, so a stomach of normal acidity can easily destroy the cholera bacillus. The use of purgative medicines, the eating of unripe fruit, or alcoholism may all predispose the stomach to accept rather than reject the organism. In a dramatic demonstration given in the 1880s, the great German pathologist Robert Koch consumed in front of his students a capsule of infected matter from a cholera victim. He made quite certain that the pH of his stomach was below the normal value before he risked his life. Cholera bacillus is also killed by a temperature of more than 60°C (140°F), so tea and coffee are always safe. The reservoir of infection is often drinking water, in rivers or in reservoirs. The bacillus is not killed by adding whisky to water, contrary to what old Indian hands may have told their children.41

There were six great global outbreaks in the nineteenth century. The first, in the years after 1817, reached China and Japan in the east, Astrakhan in the north. The next epidemic started in 1826, reached Astrakhan in 1830, Moscow and 13erlin in the following year, Paris and London in 1832. Carried to Canada by emigrants the same year, it reached all the North American cities by 1838. The next outbreak reached Europe in 1847 and lasted until 1855. The next two outbreaks, in 1865-9 and 1884-8 were taken from India to Mecca by Muslim pilgrims, and from Mecca all over the Muslim world, and by contact all over southern and then northern Europe.42

The final cholera outbreak was so widespread as to be almost a pandemic rather than an epidemic. From 1892-5, the disease raged all over the world. In Hamburg, in 1892, 50 per cent of those infected died, nearly 9,000 of them. The same sort of story came out of France, England and most of Western Europe. The next year, it was prevalent in the Americas. By
1895, it covered Asia. The situation was so serious that stern efforts were made to 'cure' the problem. These were much inhibited by the received wisdom of the day, which rejected the theory of germs causing disease. Pasteur had discovered the first bacillus (of anthrax) in 1876, Robert Koch found the tubercle bacillus in 1879, and the cholera bacillus in 1883. Yet the Establishment still claimed, as did the great Greek physician, Hippocrates, that sudden epidemics appeared out of the soil, the miasma left there by dead bodies.

This was the perceived in medical schools in the 1880s and 1890s, despite the efforts of the followers of the Renaissance germ theory of the Italian Girolamo Fracastoro (1483-1553). Had it been theories of contagion which had instituted the practice of quarantine? Or was it observation? In Venice, quarantine was instituted before 1450, a century before Fracastoro. It became common in every port by 1800. Unbelievably, quarantine was repealed as a compulsory precaution in England, the world's then greatest trading nation in 1896. This was coincidental with early pathological work by Sir Almroth Wright, whose pupils later included the inventor of penicillin, Sir Alexander Fleming. It would not be the last time in the world when an obstinate, almost invincible ignorance coincided with the beginning of enlightenment.43

Until the true nature of diseases was revealed by observation, microscope, logic, experiment, thesis, antithesis and synthesis, the Establishment held sway in a bluff, no-nonsense kind of way. Unfortunately, however, there was plenty of nonsense.

As late as 1895, after the work of the French physician Alphonse Laveran in 1881, malaria was still said to be often due to the upturning of virgin soil. This released the miasma. Dysentery, typhoid and cholera organisms were present in the localities where the outbreaks occurred. Against all the evidence, smallpox, bubonic plague and typhus were due to the 'floating atmosphere' of the place, ship or city. Smallpox could be vaccinated against. Plague could be avoided. It was, however, recognized that the building of new jails and poorhouses reduced the incidence of typhus. This is now known to be because rats and fleas live with greater ease in old buildings rather than new, old ships rather than new, old cities rather than new.

Nevertheless, most physicians of the last quarter of the nineteenth century refused to accept more than a generalized explanation for the prevalence of serious epidemics and pandemics. It was back to the times of Hippocrates who had died in 359 BC, or thereabouts. Charles Creighton, a leading medical man of his time, actually wrote a huge, tendentious study, History of Epidemics in Britain, in order to disprove the new germ theories of the modern pathologists. This came out in 1891 and 1894, nearly 2,000 pages in each volume. The book was highly recommended by the obscurantists of the day, and the Establishment.

It did not last long at the top. Within twenty years, the theories of Pasteur, Lister, Koch and Ehrlich were as widely accepted as the old 'truth' of Hippocrates was discredited.

Within a generation, every serious infection was at least traced in its course, and avoidance or prevention became routine. It would not be until the advent of the sulfa drugs and the antibiotics that true 'cures' became possible.44

38 There are numerous cases of female cooks, bakers, dairymaids, acting as carriers over many years. The longest known case was for fifty-two years, during which the woman showed no signs of the disease. How many men did she infect?
39 Unlike typhoid dysentery was in no way affected by the introduction of Florence Nightingale and her nurses in 1855.
40 In some armies, anti-typhoid vaccines were in use as early as World War I.
41 The antiseptic virtues of alcohol provided a fashionable excuse for the ingestion of hard liquor. Earlier, it was the reason for the use of wine and water mixtures, and of 'small beer', a very weak brew which, however, was safe to drink. Hot drinks were also safer than water.
42 Pilgrimages have always been great disease distributors. In India, it was the confluence of Hindus at the holy city of Benares that spread cholera throughout Hindustan; in Europe, it was returning pilgrims from Jerusalem who were responsible for bringing back one kind of tuberculosis. Pilgrims to Mecca ex-changed and encouraged smallpox. Pilgrims to Canterbury or Rome spread disease on both outward and return trips. The Pilgrim Fathers, to make a point, brought smallpox, measles, and influenza to the Amerindians of Massachusetts, even though it is known that some sort of killer-disease had already spread from the French in Nova Scotia in 1616-18. The point is made. Pilgrims who, in the Middle Ages, may have out-travelled soldiers or sailors, spread disease wherever they went, as did every other traveller.
43 Sir Almroth Wright, 1861-1947, was responsible for training innumerable fellow doctors in the pathology of parasites. In World War 1, he successfully introduced antityphoid inoculation into the British Army. He was present, as a young student, at the early lectures by people like Robert Koch, whose work on septicemia (1880) led to his identification of the TB bacillus
in 1882, and of cholera in 1883. Wright, in turn, gave Alexander Fleming (1881-1955) the impulse to develop penicillin with Howard Florey (1898-1965) and Ernest Chain (1906-79). Since Robert Koch had sat at the feet of both Lister (1827-1912) and Pasteur (1822-95), there is a fine, almost apostolic succession through the work of Almroth Wright.

By the 1960s, it was predicted that 'most' disease would be eliminated. One has been officially 'abolished' - smallpox. If it ever returned, the carnage would be at a level comparable to the Black Death, since inoculation was also 'abolished'. Measles, chicken-pox, German measles, whooping cough and some other childish diseases have been controlled by prophylactic inoculation or vaccination. Malaria, once optimistically put into the 'to be abolished' column, has, in fact, become much more serious, perhaps now affecting 10 per cent of the human race.