

## Editorial

All the infections that the sun sucks up  
From bogs, fens, flats, on Prospero fall, and make him  
By inch-meal a disease!

*The Tempest*, II.II.1–3

In the days when the Church underpinned all human activity in Europe, it was the norm that the Great Litany, which catalogued all major catastrophes or disasters, was regularly chanted with great solemnity on 'high days' in the churches – a tradition that is continued during the Easter services. When a major incident involving death and destruction occurred, or a plague raged, the recitation of the litany was a feature of the liturgy. The communal supplication prayer, *Te rogamus audi nos* (we implore Thee to hear us), rang out lustily from the congregation through cathedrals and village chapels alike, after each individual potential catastrophe was catalogued in this prayer. To help this supplication along, solemn vows were made in perpetuity by entire communities; these included the institution of annual pilgrimages and processions to holy shrines, often preceded by days of penance and fasting. *Ex voto* altars and new chapels were duly erected and richly adorned and endowed in remembrance of divine and miraculous deliverance from such calamities.

The havoc that is being currently wreaked in Britain by the 'foot-and-mouth' epidemic of farm animals – or to be more precise for the sake of the purists, this epizootic – has reached quasi-pestilential levels. This disease has placed the nation on a campaign alert with the Armed Forces having to be called on to aid the civilians combat this problem – most certainly an occasion for the recitation of the litany. The infection is caused by a 20–35 micron diameter, roughly spherical or hexagonal, picorna virus that effects the upper respiratory and alimentary passages. It is transmissible with great ease through the consumption of food, mainly meat, contaminated by the virus, direct inter-animal contact, contact with secretions and faeces of infected animals, and any other fomites that have come into contact and become contaminated. The virus can also be carried along the prevailing wind and by birds and other fauna. The virus does not kill, but debilitates and emaciates the animals that it infects by causing them problems with feeding. It is known to be endemic in farms in a number of countries and is said to occur naturally in the hedgehog. Yet this virus is easily destroyed by simple disinfectants, including hypochlorite and sodium bicarbonate and should, at least in theory, be containable.

In an attempt to contain this widespread disease, this country has had to resort to the mass slaughter of diseased animals and of other farm animals which may have come into contact with the virus. Those animals at the periphery of an infected farm also have to be destroyed to produce a circle of contagion-free countryside, a 'fire break' as it has come to be known: entire flocks – some of highly prized and irreplaceable rare breeds – have had to be destroyed, and with this the livelihood, and the pride and joy of many farmers. This policy has produced ever-increasing ripples of personal and national tragedy that increases day by day as the number of proven cases reaches beyond the thousand mark and infected cases continue to be discovered

throughout the UK. Man-made boundaries have not been respected and obviously transgressed by the virus; in spite of the institution of substantial precautionary measures, further spread across international frontiers to other countries in Europe was confirmed at any early phase.

The subsidiary problem that has to be solved is that the carcasses of the dead animals, more often than not slaughtered as a precaution rather than because of illness or direct contact, have to be got rid of promptly and effectively and in a manner that ensures that underground water sources are not contaminated by their interment. This has led to the construction of enormous funeral pyres and deep trenches on disused airfields to dispose of the carcasses of the dead animals – scenes throughout the countryside which, when viewed from the air, are reminiscent of an apocalyptic Armageddon or Dante's *Inferno*. The emission of the large quantities of carbon dioxide, nitrogenous fumes and dioxins from these incineration sites that have been burning for days is said by some to rival emissions from any other industrial source – more reverberations from the same epicentre. The disposal teams have not been able to keep pace with the slaughter and large repositories of dead animals, gradually decomposing, accumulating in farms whose owners have been unable to leave the premises because of the confining 'quarantine' regulations in force. This has added further to the misery inflicted on the agricultural community.

Mercifully, as the virus does not cross into the human species with any ease, foot-and-mouth disease is of more major veterinary interest rather than of direct medical import. However, a number of salutary lessons can still be learnt from the manner of initiation, progression and attempted containment of this microbiological condition. Perhaps quite fundamentally, a primary consideration must be that the disease appears to have been transmitted, at least initially, through the feeding of contaminated meat to farm animals – a sad lesson that should already have been learnt from Human Variant CJD, both in its bovine and human expressions. This should underline the continuing need for constant and meticulous vigilance by public health and environmental health officials and their careful monitoring of the entire food-chain for suspect practices, old and new. The careless introduction of a toxic or contaminated item somewhere in the course of feeding practices of farm animals may result in its dissipation widely and uncontainably, with the potential for the introduction of a widespread human problem. Contamination of cattle will lead to infection of milk and other dairy problems, the effect of which is even more wide-ranging.

Without too much of a mental leap, all this once more raises the spectre – true or false – of the introduction and increasing use of genetically modified foods for human consumption. What would happen if 'something', just as capable of rapid spread and pathogenicity as foot-and-mouth disease, were to find its way into the human food-chain from this practice, against every precaution? The

rationale for experimenting with genes of vegetables and cereals is comprehensible and perhaps even laudable in terms of increasing yields and meeting the demands of the poorer nations. But are the safeguards that are in place and the tests that are in use sufficiently robust and comprehensive as to forestall and prevent any possibility of rogue genes entering the food-chain? If ever there was a barely imaginable doomsday scenario, it certainly would be the annealing of altered genetic material from such a source into human genes.

Another elementary consideration that comes to mind from this tragedy must certainly be the relative ease with which this viral disease appears to have hoodwinked all that eminent government scientific advisors could think of in terms of very substantial and radical methods of controlling and ensuring its containment. A previous large-scale spread of this disease had occurred in Britain, and they were thus pre-armed with the benefit of the lessons learnt from the previous similar spread of foot-and-mouth disease in 1967. This rate of movement of the infection from one area to the next still surprised those in charge, and this is even more worrying given the fact that the economic implications of this disease had ensured that any measures which were deemed essential, no matter how radical, were indeed meticulously put into action; these measures were even given a statutory backbone with sanctions against transgressors, and it was in everyone's interest to observe them to the letter. There was also the availability of the 'destructive option,' namely that healthy animals reared adjacent to known cases could be slaughtered wholesale to break the cycle of spread. Yet to no avail initially! Effective formol-inactivated vaccination is available against this disease but this option was not considered until quite late on and largely discarded: this was more in the interest of long-term meat export facilitation, and the predicted unenthusiastic attitude of the consumer to the sale of carcasses post immunisation, rather than for any intrinsic immunological rationale.

This devastating viral illness has certainly provided food for thought and the 'what-if' scenario must certainly be in everyone's mind. What would happen if some virus were to rear its head among humans and was capable of spreading in the same way as foot-and-mouth? What about bacteria – they surely must be more readily controlled? But are they? Methicillin-resistant *Staphylococcus aureus* (MRSA) has caused many a hospital ward to close and many a nightmare for microbiologists and infection-control personnel, and yet the current containment of these bacteria is far from successful. The recent sequencing of the genome of these organisms may perhaps lead towards a more radical solution but bacteria still have a few tricks up their sleeves which make them very deadly and respectable adversaries.

This is exemplified on a small scale in the recent clustering of cases of tuberculosis in a Leicester community school, and also, about a year ago, in a bacterial outbreak amongst drug addicts, mostly in the Midlands and in the West of Scotland. The latter drug misusers started to experience lesions of serious synergistic gangrene and necrotising fasciitis in their limbs, to which a number of them actually succumbed; it took several months of hard sleuthing and joint effort with the National Institute of Health of Bethesda, US, to eventually track the cause down and to isolate *Clostridium novyi* from the drug cache that these addicts appear to have been using for 'skin popping'.

In the meantime, other addicts died after coming down with the infection; all the know-how and microbiological expertise was no match for this bacterium.

A turn for the better in the general muster against foot-and-mouth disease occurred when the Armed Forces were called in to assist, so much so that opposition party politicians suggested that the whole operation be permanently and completely transferred to the Army lock, stock and barrel. Effective solutions appear to have been found overnight by Armed Forces' personnel for problems which had arisen and which were still largely unsolved. Pertinent advice was given and the whole operation suddenly became more efficiently and effectively controlled. On the same lines, but in a completely different context, the National Health Service of this country has been built on the experience and know-how of those who have served in World War II, and later on that of those medics involved in the Suez crisis. This begs the question as what it is in the training of officers and other military personnel that enables them to acquire the capabilities of logistic planning, problem-solving, and other managerial and administrative qualities, which are so effective in warfare and put to similarly good use on their return to 'Civvy Street'. This propensity for officers to devise a planned attack on a problematic situation as it presents itself appears not to be confined to Britain, but seems to be a trait inculcated into those of officer rank by many other military academies throughout the world. Perhaps there is major scope for learning from this, and civilian organisations would do well to borrow a few leaves from the military educational tome.

The seeming lack of absolute control of this veterinary disease, in spite of all the available options, points to yet another pathological battle which affects humans and which is to date still out of control; the fight in this instance is against the scourge of drug addiction. The penalties that are being paid daily by those who misuse legally controlled substances in terms of human morbidity and mortality have, if anything, increased over the years rather than diminished. The tragic spin-offs that follow in the wake of addiction are a veritable litany of catastrophes, both private and general: criminal activity that addicts are compelled to indulge in to finance their habit; sometimes overwhelming law enforcement and judicial involvements; the ever-upward spiralling population of prisoners and inmates of young offenders' institutions incarcerated because of crime related to drug addiction; and the heartache of families from all strata of society that have to observe their partners, relatives, children and grandchildren being sucked relentlessly into the deadly whirlpool of opiate, benzodiazepines, cocaine, 'crack' and amphetamine abuse – often in combination. Is there a solution to this problem and a possible containment of this plague?

Various policies have been tried with some effect but as yet the problem has not even been dented, let alone disposed of or made to decline. Needle-exchange programs and intense public and school educational campaigns have backed the policy of 'responsible and safe drug use'. Drug substitution programs, utilising such drugs as methadone and dihydrocodeine – and, in Zurich, pharmacologically-pure diamorphine – have also been tried as a containment measure with dubious results, and with the added problem of variable amounts of leakage of some of these therapeutically-provided drugs into the community with secondary problems therefrom. Police and custom officials

have waged unceasing campaigns against drug-smugglers, with ever-escalating confiscation of larger and larger consignments of black-market drugs, ever more ingeniously concealed and transported. A drugs czar has been appointed by central government to oversee and coordinate this whole anti-drug operation on a national level. He has been tasked with the production, promulgation and overseeing of nation-wide medium- and long-term stratagems. But yet more drug addiction is recorded, the level of drug-related crime has not been curtailed, and the number of deaths from the direct effects of drug abuse has not changed in any appreciable manner. Prisons and other custodial institutions, instead of successfully rehabilitating and re-educating addicts, and attempting to wean off their inmates from controlled substances, are being pointed to as institutions where drug habits may have been initiated, diversified or worsened. If this observation is correct to any degree, this surely constitutes a sad – and mostly unacceptable – indictment of the custodial system. The confiscation of assets considered as proceeds of drug peddling is yet another arrow in this quiver of anti-profiteering measures. This legally enforceable sanction against drug ‘barons’ has hit the bedrock of the potential infringement of the human rights of the ‘accused’, and to some extent this policy may have been holed if not scuttled completely.

In Scotland, the Registrar of Deaths ensures that a brief form is specifically completed in each drugs-related death by the doctor certifying the death. This gives some background on the decedent in each of these deaths, as well as the drugs that have caused death and the background to each individual death. Annual figures from these notifications are culled and published, and there appears to be no retrospective and meticulous inquisition into each of these deaths. As death investigation is carried out in private within Scotland (as compared to the public method of investigation of sudden and unnatural deaths which is the mainstay of the Coroner system in the rest of the UK), there is no opportunity at which many of these deaths could be looked at closely nor the various systems which are in place for assisting those with a drug habit tested.

Just as all maternal and neonatal deaths are given special treatment, should not the medical profession, through its civil service component, scrutinise each and every one of these drug-related deaths, outwith the criminal context, and seek to find out if and where the system has failed these young people, and also whether similar deaths could be prevented? Such a scheme should also serve to part-audit the large sums of money which are being spent in this arena and perhaps focus our efforts. It may be argued that the specific choice of these deaths for special scrutiny is an invidious one, and that many other, perhaps more deserving, causes of mortality should be scrutinised. This may indeed be so, but given the multi-disciplinary ramifications of drug-related deaths, the young age of the decedents and their manageable numbers, serious consideration should be given even to a pilot scheme.

In turn this human man-made greed-instigated epidemic of drug addiction will yet again result in a microbiological epidemic as has occurred with HIV transmission. Most drug addicts in Britain are infected with the Hepatitis C virus, which, gradually but inexorably, will take its toll on their livers and lead to an increasing number requiring high-powered care for liver failure. It will also lead to an excess of hepato-cellular carcinomas in such patients and an ever-

increasing demand for liver transplantation. No vaccination for this condition is yet available, and no effective antiviral drugs that can curb or remove the virus from infected hepatocytes are yet on the market. This may be yet another impetus for a more careful medical scrutiny of fatalities among drug users.

Given the many ramifications into primary and hospital care and into community medicine and public health, there may perhaps be scope for a joint initiative by the Royal Colleges, a stocktaking exercise and joint comprehensive forward-looking initiative, coordinating with and supplementing all the other initiatives of central government and many voluntary organisations.

Because of all that has befallen Britain, 2001 may yet come to be regarded as an *annus terribilis*. The country has turned the corner in the control of the ‘foot-and-mouth’ disease, but the farming industry is still in major disarray, and the countryside is yet to recuperate in what appears to be a lengthy convalescence. In managerial speak, problems should be transformed into opportunities, and the many difficulties that have been visited on this country should serve as reminders for the need for vigilance in safeguarding our food supplies and as salutary lessons in public health medicine.