

## Mother Tongue

**On** 8<sup>th</sup> April 2006, a dead swan washed ashore on a harbour slipway near the town of Cellardyke in Scotland. Veterinary pathologists confirmed the likely cause of death was infection with the H5N1 strain of the influenza virus. Shortly afterwards restrictions were placed on movement of people in and out of a wildlife protection zone in Eastern Scotland. The civil emergency response team known as COBRA was activated. News coverage of these events was extensive in local media as far afield as Western Australia, where health experts commented that attempts to control the global spread of avian flu had clearly failed <sup>1</sup>.

There is a deep sadness in the death of a swan. Swans are big in European folklore. Their grace and beauty have been celebrated for centuries, from the Slavic countries through to the Celtic fringe. Alive, they cruise the flyways of Europe in stately grandeur. But in death, they quickly lose their pristine white and take on a muddy grey-brown finish, as if recaptured by the grubby reality of mortality. Earth to earth; dust to dust. Government scientists acted out a curious ritual around the carcass of the Cellardyke swan. Serious looking men in white clothing tended the swan's body. They spirited it away to read its entrails. There were other pictures; shots of men in protective overalls, aprons, and face shields cautiously preparing the swan's body for closer examination. There was a tender reverence in their handling of its lifeless form, their clothing preventing any direct contact with its tissues. These scientists could hardly have chosen a more effective way to create a sense of awe

around this one swan's death. Only professional stage management could have given us a longer running production.

### SWANSONG

The Cellardyke swan was initially reported to be a Mute swan (*Cygnus olor*), the commonest type found in Britain. Reports were subsequently corrected when a definitive identification was released. The bird was in fact a Whooper's swan (*Cygnus cygnus*), a lighter and shorter lived species that generally breeds in Iceland and over-winters in the estuaries and wetlands of Scotland, Ireland and Northern England. This species has a straight neck and its bill is black with a triangular yellow patch. Mute swans have an S-shaped neck and an orange bill with black at each end.

Tchaikovsky's ballet *Swan Lake* ran at the Bolshoi from 1877 to 1883. The original score was revised after Tchaikovsky's death for a reopening in 1895. Based on the tragic tale of a young prince who falls in love with a spell-bound swan princess whose freedom can only be regained through sacrifice and fidelity, *Swan Lake* has survived many adaptations to become one of ballet's most performed works.

The swan maiden myth can be found in Sanskrit and classical Greek legend, but is more prevalent in northern European folklore where swans abound and an animist popular culture persisted through the Middle Ages well into the modern period<sup>2</sup>.

So it was that officialdom marked the entry of avian influenza, strain H5N1, into the English speaking world. The arrival of the virus on the

shores of the British mainland guaranteed that the breaching of this geographic boundary constituted a notable public event, no matter how mysterious the methods they used to arrive at that conclusion. The fuss and bother created by the immediate aftermath of the confirmation of H5N1 virus caused an interesting range of responses. At one extreme were blasé dismissals by the good citizens of Cellardyke who continued about their daily business as if nothing much had happened. At the other were the comments of a leading WHO epidemiologist who said that attempts to control the spread of H5N1 in birds had clearly failed<sup>1</sup>.

**“Bird flu battle lost,  
human war is to come.”**

The science that explains why an influenza pandemic has not yet played out despite the dire warnings is obviously too tenuous, too speculative for an openly skeptical population. The viral credibility gap has grown so wide that it takes much more than the arrival of a flu-ridden swan to excite an outbreak of anxiety. But maybe the roots of this skepticism are buried much deeper in the fertile soil of European culture, history and language.

#### **What they meant to say**

A trawl through the spate of recent articles on influenza and related topics throws up a motley collection of scientific and technical words. Some, like *influenza* and *virus*, sound familiar even if they are used in an unfamiliar sense. Others, including pandemic influenza and H5N1, give the impression that the officials are laying a smokescreen of jargon while

they play for time. That thought may have been compounded by the administrative gibberish peppering these reports in clumsy official phrases like “worst-case scenario”, “additional facilities” and “robust system”. The submerged fears of public functionaries bobbed to the surface in comments that linked a flu pandemic with terrorist attacks and natural disasters. Of course, hard pressed public health officials are often misquoted by elements of the print and broadcast media, but very rarely given the opportunity for a rebuttal or correction of woefully inaccurate reportage. As a satirist once said; “The problem with words is you never know whose mouth they’ve been in.”

Seven time zones away from Scotland, where the skies are blue, the sea laps at endless golden beaches and healthy swans are black, it was unfortunate that local officials were in the closing stages of a lengthy planning process for an unlikely public health disaster when the dead swan washed ashore in Scotland. But that is just the kind of quirky coincidence that Australian news media like. Stories with broadly similar themes belong together in the sub-editor’s eye, connected by that conveniently elastic ailment we call “flu”. Never mind the picky little detail that avian flu has not yet spread among humans in a proper epidemic, let alone a true, globe-stopping pandemic. Not to mention the more philosophical point

that when avian flu eventually finds go faster stripes and spreads in a

**The problem with words is you never know whose mouth they’ve been in.**

true epidemic or pandemic, it will become *human* influenza. The finer points of viral molecular biology, the chameleon-like capacity of the influenza virus to shift its genetic code, and the vagaries of the human

immune response to this threat are hard enough for the specialists. Their language is too arcane for the well-informed bystander, who suffers all the anxieties of the general population without the salve of professional insight. Outside the tight clique of infectious disease specialists, microbiologists and public health physicians, people make sense of infection in more direct, earthy ways. Their language; the grammar and vocabulary they use to express their version of infection, has an interesting lineage that antedates the fundamental scientific links between germs and disease. Words have history, though we often ignore that fact. So if we want to understand what people think we meant to say, we need to take a look at where those common words and phrases have come from.

*Influenza* is a hand-me down from recent Italian and reflects a once-prevalent belief that illness

**WORDPOWER:** *Influenza*. In English use since 1743, and applied to severe colds and similar diseases since the mid 19<sup>th</sup> century. From Italian, 1504, *influenze di febbre scarlattina*: applied to scarlet fever <sup>3</sup>.

was the result of the influence of astral or occult events. Its use as a specific term for a severe cold or respiratory illness is recent. The specific sense of a communicable disease caused by a particular type of virus is even more recent and has yet to become firmly established in lay usage and non-specialist professional. Much more common is the short form “flu”, a condensation of the original used colloquially to describe almost any respiratory infection whether caused by the influenza virus or not. *Virus* comes from the Latin for poison or plant sap, and was used to signify something of infective nature as early as the 18<sup>th</sup> century<sup>3</sup>. This is the sense in which it is most often used today, rather than the more

specific technical sense of a small, filterable particle that can cause infection. Pandemic is a word that indicates spread among all (pan-) the people (-demos). Its use in connection with epidemic infection is relatively recent.

WORDPOWER: *Pandemic*. In English use since 1666. Formed from the Greek *pan-demos*, pertaining to all the people. 1853, applied in pandemic disease, modeled on *epidemic*.

### **The right words**

The words we commonly use for disease and the words the professionals use do not belong to mutually exclusive, hermetically sealed compartments. Interestingly, professional language does not always take the lead. There is traffic between the two dialects in both directions. Sometimes physicians can be doggedly conservative, or borne by the whimsical currents of linguistic fashion.

Given the eight major sources of medical English, it is useful to see how much of the vocabulary of infection has been passed down to us from the pre-modern era <sup>4</sup>. Anthrax and cholera, for instance come to us from the Hippocratic tradition of ancient Greece. Fever, a universal experience, comes from the Latin *febris* and plague from the Latin word *plangere*; to strike. But we need to be cautious before attributing too much wisdom to ancient minds. Many of those apparently Latin terms our physicians use to impress us are either the product of transfer from more modern European languages like French and Italian, or confections of Latin root words.

The early scientific era was particularly prone to paying its respect to Classical Greece and Rome through production of derivative words. The fashion was given structure and function by a system of naming living things developed by Linnaeus and widely adopted by early naturalists. This system is now widely used in the life sciences as a reliable short form of the presumed biological relationship between different living organisms.

### **GREEK CHORUS**

*Anthrax* comes from the Greek word for coal due to the skin lesions that were supposed to resemble burning coal. Cholera comes from Greek too: *cholera*, bile, melancholy is derived from: *kholer*, *khole*, bile, gall and in turn from the Greek: *kholezein*, to be green, *khloros*, green. From 1565 it was used specifically for severe digestive disorders, and from 1704 as *cholera morbus*, for a lethal disease endemic in India, with a tendency to epidemics.

Fever on the other hand was borrowed from the Latin *febris*, fever. It came through the Middle English word; *fievre*, and was adopted in Germanic & Romance languages as *fiobar*, *feivre/febre/febbre*. Variations include *feverish* from *febrilis* and *feverisch*, meaning causing fever.

Of all the different levels of relationship possible, two are most commonly used in the conventional naming system. These are first, the Genus name, immediately followed by the species name. There are rules and conventions for how these should be presented on paper. Tedious though these conventions may seem to the novice, they do mean that a species name is immediately recognisable in the middle of a sea of text: something scientists rely on when skim reading reports in the recent literature. Departure from naming conventions is one of the irritants the

lay media serve our scientists, precisely because it makes their task of finding news on their pet organism that little bit harder. Biological naming rules laid down in the early years of the life sciences left a little room for creativity and imagination. Unless there was a clear precedent in classical Greek or Latin, plants and large animals were given names after distinguishing features such as appearance, use or location.

### WHAT'S IN A NAME

Carl Linnaeus, 1707-78, was a Swedish botanist, physician and zoologist. Linnaeus invented and developed the first system used to reliably classify living things according to shared characteristics. He has two claims to taxonomic immortality because the naming system is named after him (i.e. the Linnaean system) and he chose the formal name of *Homo sapiens* for our own species. Ironically, there is some confusion over his own name because the Swedish convention in his day was to not use a surname. The name he is most often known by is Carl Linnaeus or Carolus Linnaeus, since most of his published work was in Latin. After being honoured by the Swedish monarch his name became Carl von Linné.

The Linnaean binomial system gives us a Genus name first, i.e. *Homo*. The species name is not capitalised but is italicised when in correct combination with the Genus epithet: *Homo sapiens*. The Genus name can stand alone as a conventional proper name, i.e. *Homo*, or as a Genus name with the word 'species' after it; thus, *Homo species* or *Homo sp.*, for short. The plural of 'species' is usually given as 'spp.'. This principle is followed in the naming of bacteria, fungi and parasites but has not been applied to viruses.

Carl Linnaeus narrowly missed an opportunity for autobiographical self congratulation by getting a colleague to name a flower after him, using his own system of naming living things. Commenting on the name of *Linnaea borealis*, he said that it was "a plant of Lapland, lowly, insignificant, disregarded, flowering but for a brief space -- from Linnaeus who resembles it."

Other examples are *Canis lupus* (wolf), *Oryza sativa* (cultivated rice) and *Anopheles gambiae* (mosquito).



Many founding figures of botany, zoology and comparative biology started out as collectors and financed their expeditions through the samples they brought home. Naturalists made their name quite literally by immortalising themselves in the new species they recognised, whether collected in their own travels or not <sup>6,7</sup>. In more recent times, there has been a trend towards preserving the name of famous biologists by naming new species after them posthumously. Granted that a new variety of eponymous rose may be considered a suitable epitaph, but a little-known rodent or disease-causing microbe named in your memory may seem less attractive.

The problem with microorganisms is that the rule of thumb definition of mammalian species does not apply to these little creatures. They don't enjoy sex in a conventional animal sense. To make matters significantly worse; they share around their genetic material without pausing to consider the consequences for biological nomenclature. The self-appointed naming rights of a swathe of competing European laboratories have been added to this potent brew. The result of this hotbed of microbial neologism was a collection of bacterial species names that ran into the tens of thousands by 1980. At this point, the scientific community took bold, decisive action, gathered all the names they could find and formed a committee (International Committee on Systematic Bacteriology) formed to knock their collection of names into shape and reduce it to a more manageable size. More to the point, some of the weirder constructions disappeared at the stroke of a pen.

Although 1<sup>st</sup> January, 1980 was set as the starting date for the new bacterial nomenclature the growth of listed official names didn't stop

there. The microbes continued to proliferate, differentiate and ultimately speciate<sup>22</sup>. Then bacterial naming got a set of skates when it started using rapid genetic methods. Increasingly wider access to equipment that can read an entire bacterial genetic code has given a further boost to the generation of microbial names so that subject experts can have severe difficulty keeping up with the descriptive features of their chosen genus. It is still difficult to understand how a new species should be defined.

### *NAMING RIGHTS*

Natural scientists are always on the lookout for opportunities to give their name to something. Pasteur, Lister, Klebs, Neisser, Salmon, Morgan, Burkholder and Escherich all have a genus named after them. Today, the hunt is on for new species.

Without easily verifiable criteria such as the ability to breed with other members of the same species, there is no single agreed method for determining the need for a new species. Arguments generally centre on the amount of genetic relatedness. Recent opinion favours an ecological approach, i.e. a specific biological entity that occupies a defined biological niche.

The term 'speciate' is often used colloquially for the process used to identify bacteria, fungi or viruses to species level. Strictly speaking, the term should be reserved for the process used to determine that a given biological entity belongs to a new species, or for the evolutionary process by which a novel species came into being.

Guidelines were laid down for choosing bacterial names at the Second International Congress of Microbiology in London in 1936. The basic principles are still used today. Names have to be (a) stable: the first name published gains priority; (b) unambiguous: type cultures of the organism are kept as a point of reference; and (c) necessary, according to the published description of features.

Microbiologists occupy a spectrum from the splitters who like to subdivide the smallest biological division, to lumpers who prefer to group everything together. These two factions clearly have diametrically opposed objectives. The pragmatic consideration both fail to recognise is the need to retain a degree of practical relevance such as the capacity to cause or not to cause disease.

The commoner infectious diseases got their popular names long before anyone had to worry about how to give names to tiny living things that possess a capacity to cause disease. These are words with which we are familiar. They have a homely feel to them precisely because we use them at home and in our humdrum, everyday lives. Fever, chill, cold and temperature are all instantly recognisable references to the change in body temperature we experience when ill. Fever happens when the body's internal thermostat changes its set point to allow a higher core temperature. This aids the body's natural defences and used to be exploited in the pre-antibiotic era when malaria was deliberately given patients with syphilis to treat their syphilitic infection. Other changes we notice when running a fever are sweating and sometime a cold, clammy feeling in our extremities when the circulation tries to shut down. The shivering, sometimes violent shaking of a chill is the opposite experience when we feel cold through a temperature swing in the other direction.

Some of the earliest systematic descriptions of disease come from Classical Greece, through the teachings of Hippocrates. By using careful observation and simple descriptive language, Hippocrates' pupils gave us the main features of inflammation: redness, pain and swelling <sup>5</sup>. We added little to this through the entire Imperial Roman period which

passed on much of the system through Latin to the far reaches of the Empire. Though this was mostly lost to Europe during the Dark and Middle Ages, classical medical skills were preserved in Byzantium, in the Islamic world and by Jewish scholars<sup>8</sup>. Meanwhile, northern invading European cultures gave early English a new set of descriptive terms for parts of the body and the symptoms of common ailments like cough, sneeze, boil and ail.

Nothing prepared the European population for the cataclysm of the 14<sup>th</sup> century. The phrase 'Black Death' only came into use recently around the same time 'bubonic plague' was adopted as a specific technical term. The terms used in several European languages translate as 'the great dying' for that is exactly what happened. The population of Western Europe was decimated by wave after wave of fatal disease, crashing through the cities, towns and villages of late medieval Europe. Plague followed the line of least resistance along trade, pilgrim and military routes. From time to time, it jumped ship and travelled across the main water barriers of

## The Black Death turned the world upside down

Europe so that its first wave took only three years to sweep from Constantinople in the East to Ireland in the West. Scholars, priests and nobility were unable to put an effective barrier in its way. The subtleties of spread by fleas from dying rats were beyond the imagination of a mindset still firmly located in the prevailing superstitions of the time. To be fair, there are many accounts of heroic sacrifice by those caring for the sick<sup>28</sup>. But little could be done to stop the disease from taking its toll as it The scale of the natural disaster is difficult to imagine in today's terms without reference to huge events like the Indian Ocean tsunami of 2004.

But even that diminishes the impact plague had on Europe since the tsunami happened one a single day. After the tsunami passed the waters subsided, life resumed and aid arrived from neighbouring communities.

When the Black Death arrived, it turned the whole world upside-down. Neighbouring communities were either paralysed by fear of contagion or had fallen victim to plague. The mortality was so high that there was an immediate shortage of manpower. Nobles found it difficult to till their fields or mill their grain. There was no surplus manpower with which to raise a feudal army. Ecclesiastic authorities were unable to offer a terrified populace any comfort or reassurance. Workers were hard to find for the huge building projects of the age; castles and cathedrals. The cost of labour on farms went up, starting a series of events that led to the end of serfdom and a break-up of aristocratic power.

Plagues, in the sense of epidemic diseases, have made their mark on history since its earliest records with far-reaching effects across time and geographic space. There is a lot of baggage wrapped up in such a small word. Alternative terms still occasionally used to describe epidemic disease are *pestilence*, *contagion*, and when specifically applied to animals; *murrain*. None of these have quite the same ring as plague, with its immediate cachet of death, disease and civil disturbance on a grand scale.

These historic associations suggest a reason for the terrorism value of plague over tuberculosis, despite the fact that the latter disease kills many more people worldwide than bubonic plague did at its peak. Plague has passed into folklore and common usage in a way that a disease with a technical “-osis” name will never do.

## PLAGUE

The Black Death swept through Western Europe from south to north between 1347 and 1350. Plague continued to appear in outbreaks in parts of Europe until the 18<sup>th</sup> century. The last plague outbreak before the effect of antibiotics was in Burma in 1947 and caused over a thousand deaths. A total of 1000-3000 cases of plague is reported to WHO each year.

In 1665 the village of Eyam in Derbyshire, England put itself in voluntary quarantine to halt the spread of plague. Infection had reached this isolated community most probably in a bolt of cloth brought in from London which was in the grip of the Great Plague. Over 250 people died of bubonic plague in Eyam; more than a quarter of the population but their willingness to comply with the *cordon sanitaire* prevented the spread of plague to neighbouring villages.

It was suggested that the extreme forms of behaviour seen during the Terror of 1793-94 can be traced to patterns of civil disorder seen during the French plague outbreak of 1720-22.

**WORDPOWER:** *Plague*. From 1382, an. affliction, calamity, evil, scourge. Originally from Latin, *plangere*, to strike, lament, therefore a stroke or wound. Related to Greek, *plaga*, a blow. Old Irish *plaige*, plague. From 1601, bubonic plague. From 1481 as a verb, and from 1594 to bother, annoy. From 1823 bubonic plague was named Black Death by Elizabeth Penrose in her History of England. Most contemporary accounts in other languages used "great dying" for the Black Death.

Plague and all its associated connotations such as the horrors of hell, are preserved for us in the graphic art of late medieval Europe. Cautionary tales preserve for us the fear of its victims. More recent evocations of the period have been brought to us in movies such as Steinberg's *Dance of Death*. The picture of the grim reaper silhouetted on the skyline with his followers in tow is a contemporary version of the figures carved in bas relief on medieval cathedrals and town halls. The Great Plague of London was a late ripple in the repeated waves of plague that afflicted Europe.

The great epidemics that fell on urban Europeans during the industrial revolution or after the upheaval of the Great War decimated whole populations but were caused by other infections. The Spanish flu of 1918-19 killed more than died in combat during the First World War. Most of major disease events leave some kind of mark on everyday language as, one by one, they became household names: cholera, diphtheria, measles, rheumatic fever, scarlet fever, tuberculosis, typhoid and typhus.

The 19<sup>th</sup> century was a time of rapid scientific advance across a broad range of fields. The foundations were laid in the natural sciences for a comprehensive understanding of the mechanisms of infectious diseases. At the same time as the early microbiologists powered ahead with their ideas about germs, the public health physicians were developing reliable methods to recognise and follow the spread of diseases. The hygiene movement emerged in the middle of this maelstrom of scientific activity. The movement was a loosely associated bunch of publicly spirited do-gooders, interventionists and busybodies who established a mandate for public sanitation. They saw the interests of the public health best served

by cleanliness and waged war on filth in all its varied forms. Probably their greatest achievement was the permanent separation of human effluent from drinking water in public works that outlasted their architects by at least a century. The genius of the hygiene movement was that its methods, reasoning and argument were deliberately populist, rather than their instincts which were paternalistic and middle class. Even today, their writings possess an ability to communicate a sense of quiet outrage<sup>9</sup>

You'll catch your death of cold

The hygiene movement quickly caught onto the idea of inserting its propaganda into the domestic environment. Mrs. Beeton's famous cookbook contained a whole chapter of domestic medical advice<sup>10</sup>. This rode well with the aims of the self-help movement and other such trend-setters in the emerging working classes of the new industrial cities. Mothers; the carers and nurturers in most families, were a soft target for the

hygiene message. And like

**“To oppose cholera, there seems no surer or better means than cleanliness, sobriety, and judicious ventilation.”**

any successful marketing campaign, the early hygienists found themselves acting as interpreters of a new language to users of the old. Words and phrases were borrowed from the old to give credibility and familiarity to the new. In the 20<sup>th</sup> century, this system became more formal in Britain where midwives and health visitors were until very recently almost exclusively women's professions. These two professional groups represent the recent manifestations of a tradition of women's



informal health wisdom that goes back many hundreds of years and which is still largely impenetrable to male-dominated professions. That sense of a separate body of wisdom or insight has been one of the persistent sources of friction between these professional groups and other health professionals for many years.

There are still vestigial elements of that old maternal wisdom left in some of the folk sayings that allude to infection. “You’ll catch you death of cold!” is one that I remember from my own childhood. Taken at face value, this could have been a simple reference to the risk of hypothermia on a cold winter’s day. But this saying has a subtle barb; the word “catch”. Death is not normally something you think of as catching, or epidemic. It sounds uncontrollable, like wildfire. But then there is the paradoxical reference to cold.

Not death *from* cold. This was the genitive version; “death *of* cold”. Its meaning, when fully unwrapped was closer to: I know best. If you go out without wrapping up properly, you could be responsible for your own death through something catching like a bad cold or chill. I offer as evidence the shorter version of this stern advice: “For goodness sake! Wrap up or you’ll catch pneumonia.” Thinking through what was said in those parental monologues, the scientific inaccuracy is of secondary importance. More significant is the value system it reveals. Respiratory infection and cold weather are linked in a causal relationship. There is a play on the ambiguity of cold weather, cold from disease or chill and the terminal cold of death. It is also possible that this may reflect a link back to the old principle of humours or fluids that comes all the way from classical times. Most of all, this idea of catching something has a very

adult ambiguity between taking an active part in initiating a fatal process and passively providing the right kind of fuel for the fire to catch. These subtleties were lost on a little boy and may not have been obvious to his mother. Nevertheless, the warning appears to remain in common use today, for all its lack of rational scientific grounding.

A shorter infection proverb that remains in widespread use is; ‘Feed a cold, starve a fever’. The precise meaning of this is controversial. Some experts believe it now means exactly the opposite of that it originally meant. That may explain why it remains in common use, since you can effectively use it to mean what you want

**brief, memorable, and intuitively convincing  
formulations of socially sanctioned advice**

it to. But its passage into common use gives it credibility beyond the effective wisdom it contains. The original version intended to advise the use of feeding a patient with a cold <sup>11</sup>. Recent understanding of the version given here has put a slightly different spin on it so that some understand the proverb to mean; “If you feed a cold, you will have to starve a fever later.”

A recent addition to the English proverbial corpus is; “Coughs and sneezes spread diseases”. The immediate meaning of this neat little rhyming couplet is transparently obvious. Its style gives away its period or origin during the dark days of isolation and bombing raids in the early Second World War <sup>12</sup>. Other languages, other cultures have their share of fever proverbs. Sicily, for example has; “The man with a fever cannot taste honey”, and the cryptic; “The fourth fever kills the old but spares the young”. This may be a reference to Hippocrates observations

on fever in *The Book of Prognostics*, in which he highlights the fourth day as critical in determining the patient's outcome. The Hippocratic concept of quartans, or four-day periods is still used to describe the pattern of fever seen in some cases of severe malaria.

The familiar proverbs about fever and illness are the ones that have survived passage from generation to generation. They are useful vehicles for cultural wisdom; the accumulated wisdom of generations. As seen above, their form, content or meaning may change with time but the proverb will survive according to how apt and relevant it continues to be. What these saying appear to do more than any formal written account is preserve the essence of an oral culture by linking its elements (in this case, infection) to the living language. New sayings, aphorisms and proverbs will spring up as circumstances dictate, but their survival seems to depend on strictly Darwinian principles: survival of the most fitting. The features that stand out from the longer list of commonly used English proverbs are few, but clearly effective at aiding the memory: rhyme, shortness, paradox, evident benefit and the tag or hook that attracts the hearer's attention<sup>13</sup>. Small surprise, then that advertising uses proverbs or pseudo-proverbs extensively.

The use of proverbs, aphorisms and sayings to instill an awareness of the threat of infection indicates that this idea of infection probably operates as a meme. The concept of memes was originally enunciated by the geneticist and writer Richard Dawkins, who proposed that discrete items of cultural memory could be transmitted as memes in a similar manner to gene transfer<sup>14</sup>. Scholars have developed a science of memetics in the two decades following that proposal with its own rules and jargon.

Interestingly, they have given “infection” their own meaning and applied it strictly to the process of insertion of a meme into functioning memory so that it takes root. There is a delightful irony that the concept or idea of infection with a tangible biological agent might itself be a meme or transferable element of cultural memory dependent on its ability to establish an infection (in the memetic sense) of the memory. The success of the infection idea therefore depends on its capacity for epidemic spread. While the twisted logic of this circular argument is best left to cybernetic engineers and psycholinguistic theorists, our notion of infection clearly enjoys company, if not the life and soul of the party.

It is not clear whether there are actually two infection memes operating on parallel tracks, or different versions of the same meme following a broadly similar route. Consideration of two user groups illustrates the point. One might use ‘a plague’ or ‘outbreak’, while the other would use ‘an epidemic’ or ‘case cluster’. That could mean two separate memes: ‘outbreak’ and ‘epidemic’, or a single ‘outbreak-epidemic’ meme with user group options. If all of these belong to a super-meme known as ‘infection’, it gives us some clues on how adaptable our language has become. The vocabulary might be well established, but the language of infection is still not spoken widely enough to guarantee reliable communication between its various user groups.

#### **Descriptions and definitions**

The mood of the moment is conspiracy. We are supposed to be surrounded by coded messages, thus skepticism about claimed transparency seems a perfectly natural human trait. The recent case of Don Brown going to court to contest allegations that he had plagiarised

“Life isn’t simple, the way it  
is in detective stories.”

the plot for his conspiracy-driven *Da Vinci Code* added another level to the plot within a plot <sup>15</sup>. But our task is not to prove the existence of a supposed cabal whose insight remains closed to the rest of the world. Our task is more simply the decoding of this language people use to describe infection. Some of the commoner terms are already familiar to us. Others, though less familiar, awaken intuitive inferences buried in the deeper recesses of our spoken culture. From this motley assortment of words and phrases we can start to assemble the vocabulary of infection.

The next task in front of us is putting that vocabulary to use; giving it contextual shape and form. Describing our various ills and discussing their significance is so commonplace that it often features in attenuated form in our initial greetings; “how are you?; how do you do?; how are you going?; or the rather curt You good?”. Going into more detail than the regular niceties and platitudes is an indication of closeness or familiarity. It is usually our closer friends and family who get the benefit of a more lengthy response to the conventional wellness greeting. That requires thought, a bit of non-specialised vocabulary and acceptance of some vulnerability if we admit to suffering illness. “Not so good today, you know. Got a bit of a cold”. Is the kind of comment reserved for those who are likely to show you a bit of sympathy, or even give you some health advice. “You ought to take the rest of the day off.” or “You sound like you could do with a hot toddy.”

The first descriptions of fever come from Akkadian manuscripts during the Sumerian period. Other reports of “hot disease” can be found in early Chinese writings. The process of describing disease features

became much more systematic when the Hippocratic School of medicine in Kos developed the methods that passed down through generations for over a thousand years. The use of observable features to categorise disease was a significant departure from the prevailing superstitions that were prone to fanciful conclusions. The Hippocratic physicians may have lacked the tools to fully understand the link between cause and effect, or the processes underlying specific diseases, but their method recognised that the individual human body was worth studying in detail. Stripped of its clothing and ornaments, freed from the bounds of quaint pantheistic superstition, they were able to observe and learn.

### **HIPPOCRACY**

The idea that an imbalance of four body fluids or humours; blood, phlegm, cholera and melancholy, were the cause of all diseases originated with Hippocrates and gained further weight through the work of Galen, a Roman physician (Cladius Galenus, AD 131-201). The Hippocratic school of medicine at Kos was famous for disciplined, naturalistic observations of disease processes. However, there was debate between physicians in the ancient world on how far you could go beyond strictly empirical observations. The Cridians appear skeptical of Hippocratic method and argued that general theories of causality were not useful. In other words, making accurate observations does not necessarily solve the problem of how you proceed to a conclusion.

It does not take particularly close observation by a specialist physician to group a collection of symptoms that signify a change in body temperature: hot, sweaty, heart racing. The other extreme of temperature aberration, cold, chills, shivering may not be immediately obvious as features of the same process, unless the body swings from one to the other extreme. None of these symptoms are specific to one disease process, despite attempts by previous generations of physicians to use the pattern of fever as a route to specific diagnosis. The other features that any adult can observe without the assistance of instruments

(stethoscope), imaging technology (X-rays, ultrasound scan) or laboratory are those that relate specifically to regions of the body and its internal organs. Thus we can all relate to fever and headache as a portent of disease inside the head, or fever and painful or frequent defaecation as an indicator of dysentery.

The ability to make these connections between specific diseases and individual symptoms obviously grows with experience. Health professionals who see so much pain and suffering are likely to get the point more quickly even if the diseases they deal with occur sporadically. Epidemic disease is easier for the lay person to grasp, because the large number of cases gives observers repeated opportunity to fine tune their set of observations. Truly big disease events like the Black Death make a huge impression on a whole generation, not just because of the horror of the human drama that plays out in every home. Faced with that level of disease threat, everyone becomes an instant expert. Even children develop disease awareness, as seen in the nursery rhyme cautioning against the consequences of plague. Leprosy probably had a similar, though less immediately fatal impact on the European population during the 14<sup>th</sup> century. In the 15<sup>th</sup> century syphilis, also known as the great pox, cast its pall over Europe <sup>16</sup>. Then, during the industrial revolution, cholera, typhoid, diphtheria and tuberculosis which was also known as consumption, took over the role of the prevailing disease threat. Generation after generation learned how to name a collection of symptoms. These passed into common usage and for the most part remained in circulation, surviving the passage of time through their aptness and relevance.

Formal descriptions of disease have been available to physicians since the time of Hippocrates. They inevitably use language that is not familiar to lay people in their attempts to be specific about a given disease. Their reasons are connected with a desire to apply knowledge as a form of medical authority over disease, and do this by making predictions about the course of a disease process they have named. Diagnosis is seen as a necessary precursor to treatment and recuperation. A lot hangs on getting that name right. The more specific you can be; the fewer the generalities, the more likely you are to identify a specific disease process amenable to specific therapy.

And there lies the heart of our hope for any infection: name the disease, name the biological cause, and we can name the best antibiotic treatment – the ideal bud-drug combination. ‘Guess the name of the pathogen’ is a game played by physicians the world over. In its simplest form, the winner is the doctor who gets the name of the offending microbe right based on definitive lab results not available at the time of their guess. These best guesses are often the rationale for choosing preliminary antibiotic therapy.

There is  
a less  
obvious  
reason  
for using

**WORDPOWER:** *Infection*, from the Latin word, *infectere*, to put in, spoil or stain; *infectus*. After 1548 it was used as a specific term for communication of disease by air or water. Direct touch from person to person was contagion. From 1542, as *infectious*, meaning catching or spreading.

standard disease descriptions. If we can agree on how to accurately describe a disease, then we can use that description as a definition for our statistics. The accumulation of infectious disease statistics can in turn



be used to study the pattern of disease occurrence and spread within a community. When those diseases spread among the people in epidemic pattern statistical data takes on an even greater importance, giving health authorities hard information as they prepare to battle the latest disease threat. Many countries have a list of infectious diseases that have to be notified on diagnosis. In some countries, there may be considerable legal weight behind this process of compulsory notification and potentially draconian measures to limit the spread of epidemic disease when it breaks out. The list of notifiable disease includes plague, influenza, cholera, typhoid and tuberculosis but not the common cold.

Consider what might happen if a real case of bubonic plague turned up in a local hospital following overseas exposure. The description used to name, diagnose, report and initiate public health action for a given infection will necessarily change at each stage of the process. The patient would probably seek medical assistance when the hot and sweaty feeling persisted. By the time they saw their family physician they might already have had a shivering fit or chill, and would have lost their appetite. It is also likely they would have swellings in the groins called buboes. Their doctor would not necessarily recognise such a rare infection, unless she'd read about bubonic plague somewhere. However, she would record the features, start a few laboratory tests and reach a specific diagnosis by recovering the bacteria from the patient's blood. On making a specific diagnosis, she would inform the local public health physician, probably by phone. The laboratory would probably also inform a public health physician, acting on its laboratory case definition. Being an internationally notifiable disease, the case of bubonic plague would then be notified to the World Health Organisation and recorded in

international health statistics. Four different disease descriptions; four different definitions, each progressively more specific.

As soon as any public announcement was made, there would be press interest. The diagnosis of a case of bubonic plague in any developed country is guaranteed to stir the media. It might even cause an outbreak of journalism. In the feeding frenzy that followed, public health physicians would throw meaty morsels to the circling pack of journalists, hoping that the messages they print or utter will not confuse their own intended subtext: i.e. "It's all under control. Plague is a treatable disease that doesn't cause epidemics in developed countries. And before you ask, there was no evidence of terrorist involvement."

The print and broadcast media are an essential part of our contemporary culture. They articulate much of our public discourse and, like it or not, communicate with parts of our community that rarely give a moment's thought to the subtleties of infectious disease. We get the media we deserve, and if the professionals bemoan the level of literacy they find in the pages of our daily newspapers, we should probably all take a close look at how we communicate infection outside our immediate circle. How fluent are we? Do we have our own secret language? If not, how much effort do we put into interpreting our language of infection with our wider community? And finally, how much do we listen to what others are saying about infection? These questions will be addressed in the following chapters.

## Endnotes

1 *The West Australian*, 10<sup>th</sup> April, 2006. The paper's medical editor proclaimed on p4 "Bird flu battle lost, human war is to come: professor. Two days earlier, on 8<sup>th</sup> April, 2006 *The West Australian* devoted an entire news page to influenza. The big print headline read "Morgue trucks for WA bird flu", and the second story was headed "Britain on high alert after first death confirmed". An insert featured a map of Eastern Scotland with WA's capital namesake, Perth at its western edge.

2 *The Swan-Maidens*. Sabine Baring-Gould, Curious Myths of the Middle Ages, 1866-8.

3 *Chambers Cyclopaedia*, 1728.

4 JH Dirckx, 2002. Merriam-Webster's Medical Desk Dictionary.

5 G Chaucer. General Prologue, *The Canterbury Tales*. Four Islamic scholars are mentioned by Chaucer in the general prologue to *The Canterbury Tales*. These are Ibn Ísa, Al-Razi, Ibn Sina and Ibu Rushd.

6 W Dampier. *Voyage to New Holland &c, in the year 1699*. William Dampier, 1651-1715, adventurer, pirate and naturalist gained little from the collection of carefully preserved Brazilian, Australian and Timorese plant specimens he gave the Professor of Botany and Physic at Gresham College, London. However, he did gain some relief from his debts by writing about the expedition.

7 C Darwin. *The Origin of Species*; A Russell-Wallace, *Travels in the Malay Peninsula*. Alfred Russell-Wallace, co-author with Charles Darwin of *The Origin of Species*, was starting out as a career naturalist collecting insects, birds and plants from the Amazon basin for a commercial agent in London.

8 Hippocrates. Book of Prognostics, 400BC. Pain, swelling & redness are linked with fever and other signs of infection at several points in this early method of predicting the course and outcome of disease.

9 C Dickens, *A Tale of Two Cities*; and E Gaskell, *Mary Barton*.

10 I Beeton. *Book of Household Management*, 1861. Mrs Beeton's *Book of Household Management*, published in installments between 1856 and 1856, and in a single bound edition in 1861, includes an entire chapter on medical matters, entitled "The Doctor". She did not shrink from handing out hygiene advice on major issues of the day such as cholera: "To oppose cholera, there seems no surer

or better means than cleanliness, sobriety, and judicious ventilation. Where there is dirt, that is the place for cholera; where windows and doors are kept most jealously shut, there cholera will find easiest entrance; and people who indulge in intemperate diet during the hot days of autumn are actually courting death."

11 The Golden Era of Sept 20<sup>th</sup>, 1863, Mark Twain. 'How to cure a cold.' Writing in *The Golden Era of Sept 20<sup>th</sup>, 1863*, Mark Twain quoted this exact formulation in his article on 'How to cure a cold'. There has been much debate about whether any dietary measures should be taken in either case, fuelled by the discovery in 2002 that biochemical indicators of a favorable immune response to infection were improved by nutrition during a common cold.

12 Poster illustrated by HM Bateman, Ministry of Health, UK 1942. The full text ran: "COUGHS AND SNEEZES SPREAD DISEASES." "Trap the germs in your handkerchief". "Help to keep the nation fighting fit."

13 Hernadi and Steen "The Tropical Landscapes of Proverbia: A Cross disciplinary Travelogue." *Style* 1999; 33: 1-20. Hernadi and Steen set out a useful definition of proverbs as brief, memorable, and intuitively convincing formulations of socially sanctioned advice in their article. Their what, where, when, how and why of proverbs is a useful guide to the epidemiology of advisory phrases.

14 R Dawkins, *The Selfish Gene*, 1986. The term 'meme' was first used in the last chapter of Dawkin's "The Selfish Gene", published in 1986. Thirteen years later, he elaborated on the concept in a foreword to Susan Blackmore's "The Meme Machine" and proposed that the unit of natural selection was any kind of replicator, either gene or meme.

15 Umberto Eco's *Foucault's Pendulum*, Picador, London, 1988. The recent case of Don Brown going to court to contest allegations that he had plagiarised the plot for his conspiracy-driven *Da Vinci Code* added another level to the plot within a plot. A more erudite tour through the nether regions of European conspiracy can be found in Umberto Eco's *Foucault's Pendulum*, published in 1988, long before the *Da Vinci Code*. "Life isn't simple. The way it is in detective stories." Eco: FP, p157"; to which Brown could reply; "But they haven't turned *Foucault's Pendulum* into a movie yet.

16 Girolamo Fracastoro, *Syphilis sive morbus gallicus* (Syphilis, the French disease), (d 1553). Syphilis was the name given to the great pox by the early epidemiologist, Girolamo Fracastoro, (d 1553) in a poem of that name in which he described the features of the disease. The poem, *Syphilis sive morbus gallicus* (Syphilis, the French disease) shows who he thought was to blame.