

Fine art of medical detection

Among the scientists notable for discovering the *raison d'être* of different diseases Robert Koch must always hold a high rank. Comments on this remarkable man, by Howard Markel of the University of Michigan, are published in the *New England Journal of Medicine* for 8 December 2005.

In the summer of 1890 the 10th International Medical Congress assembled in Berlin, attended by some 6,000 physicians. One of them, Robert Koch, who for 14 years has been professor of hygiene and bacteriology at the University of Berlin, announced that he had discovered a remedy for tuberculosis. He was cautious in his claim and did not talk of a "cure". Nevertheless, within a matter of hours physicians were demanding supplies of what was called "Koch's lymph". A report of the paper, first published in the German medical press, appeared in translation in the *BMJ* on 15 November 1890.

One reader of this account, a young medical practitioner practising in Southsea, was Arthur Conan Doyle, who had just published a novel entitled 'A study in scarlet', featuring

the exploits of one Sherlock Holmes. Doyle was so excited by the Koch paper that he boarded a train for London with the intention of going to Germany. He was unable to obtain a ticket to attend a demonstration by Koch's colleague Ernst Von Bergmann at Berlin University and failed to achieve an appointment with Koch, who had been overwhelmed with correspondence from doctors all over the world and had sacks of mail delivered on his doorstep. Conan Doyle fared no better when coming across Koch face to face. However, a Detroit tuberculosis expert, Henry Hartz, met Conan Doyle and shared his lecture notes with him, obtaining for him admission to patients who had received Koch's remedy.

Conan Doyle determined that Koch's conclusions were premature, and stated so in a letter to *The Daily Telegraph* on 20 November 1890. He argued that the lymph was an excellent aid to diagnosis but that treatment was to be achieved by other means. Conan Doyle must be given credit for having helped to establish this fact.

Natural methane emissions and the greenhouse effect

Atmospheric methane has its predominant source in biological processes. The current belief is that the main sources are wetlands subject to widespread microbial activity — that is to say, natural swamps and cultivated paddy fields — and the eructation of ruminant animals maintained as a food source by humans.

It is also believed that the demands of a growing earth population for food have led to a dramatic increase in agriculture through rice culture and livestock farming, as a result of which the natural emissions of methane have intensified.

What has only recently been recognised, however, is that grasses and leaves produce methane under normal physiological conditions in the presence of oxygen and not just through microbial activity in anoxic environments — a factor that accounts for up to one third of the methane entering the atmosphere.

As a number of recent discussions in *Nature* claim, this has an important bearing on the problem of global warming, since methane absorbs solar radiation strongly at infrared wavelengths. It also affects the ability of the earth's atmosphere to clear itself of pollutants and influence ozone depletion through production of water vapour.

Methane is the second most important greenhouse gas in the atmosphere after carbon dioxide, and its levels have doubled during the past two centuries, mainly as the result of increased agricultural activity. Global vegetation as a whole may be releasing 60 to 240 million tonnes of methane gas annually and emissions rise with temperature with the faster growth of plants.

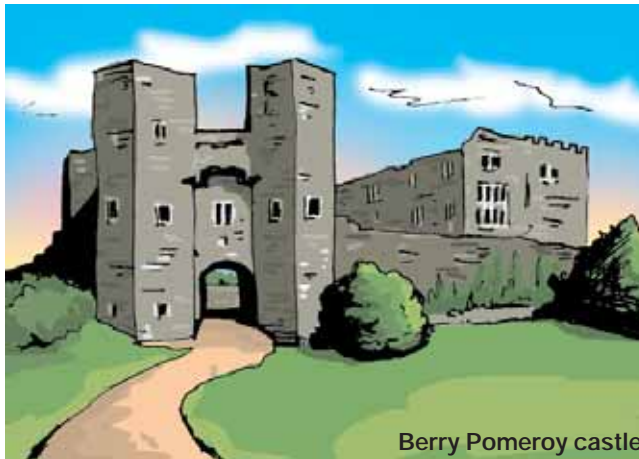
Observations from space have shown previously inexplicable plumes of methane above tropical forests, and recent discoveries may help us to understand why this occurs. They do not make our future any rosier.

There are more things in heaven and earth . . .

My part of Britain has a mass of folklore regarding strange and apparently supernatural happenings. We have headless horsemen and packs of hounds progressing across our moors and along our lanes, as well as arms that reach out from hedges to arrest one's progress. And we have old buildings in which figures in ancient garb stalk in the moonlight.

Recently my local paper featured several reports of investigations carried out by organisations that take an interest in supernatural phenomena. One place that attracted their attention is the ruined castle of Berry Pomeroy near Totnes, dating from the 15th century and once the home of the Seymour family. Elizabethan warders are reputed to patrol its ramparts, and white-clad women haunt its dungeons and stairways.

I have wandered many times around the ruins, in all kinds of weather and different states of the light, but have never encountered any figure that appeared sinister or inexplicable. However, I did come across a puzzling experience after having taken a number of photographs of the architecture. When one batch of photographs was printed it clearly showed a lofty portion of walling in which was a series of glazed windows with carved medieval frames. On a later visit to the place I was intrigued to



Berry Pomeroy castle

note that in fact there were no windows there, but only the old frames with solid stone replacing them. And an old engraving of the place made two centuries ago featured the windows as they were in my photograph.

They say the camera cannot lie, but somehow mine had taken a leap backwards and recorded something that had ceased to exist. I cannot think of any rational explanation of the phenomenon, but it ranks with another experience in which I was walking along a narrow pathway near the edge of a cliff with a thicket to one side. I heard footsteps following me, and drew into a convenient gap to allow the walker to pass. The footsteps faded, but no one appeared, although my dog showed every sign of welcoming a fellow traveller. Again, I can think of no satisfactory explanation.

And I quote . . .

Unfit to lead civilisation

"Races petrified in dogma or demoralised by lucre are unfit to lead civilisation. Genuflexion before the idol or the dollar atrophies the muscle which walks and the will goes." — Victor Hugo, in 'Les Misérables' (1862).

Science has outrun human spirit

"The means by which we live have outdistanced the ends for which we live. Our scientific power has outrun our spiritual power. We have guided missiles and misguided men." — Martin Luther King (1963).