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From Dickens’ Dream Children, Dickens, Mary Angela (Charles Dickens’ grand-daughter p. 49, at the head of the Second chapter, “Smike, and Dotheboys Hall” Page 49. Raphael Tuck & Sons, Ltd., 1926
The Victorian Web http://www.victorianweb.org/art/illustration/dreamchildren/4.html
Transactions <www.leicestertilitandphil.org.uk>
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CHAOS AND FRACTALS 1: SCIENCE MEETS ART?

Presidential Address by Professor John Fothergill
Department of Engineering, University of Leicester

Lecture delivered on 3rd October 2011

When the Leicester Literary and Philosophical Society was founded, there may have been many discussions on determinism and free will. Laplace had announced his proposition in 1814 that if the positions and momenta of all particles in the universe were accurately known, then their positions and momenta could be calculated at any time in the future. His ideas did not survive the twentieth century, when the mathematics of deterministic chaos demonstrated themselves in the Butterfly Effect and the unreliability of the weather forecast. The natural world is determined by the laws of non-linear systems, which govern chaos, and produce the natural shapes around us which differ so much from the circles and squares of traditional geometry. Out of this comes the study of fractals, which another French mathematician, Mandlebrot, described as the Geometry of Nature. The beauty of fractals may inspire art and the semi-predictability of chaotic systems may inspire music.

Introduction

In the twentieth century, with the advent of computers, it became possible to explore the dynamics of non-linear systems. Whilst at first sight this might not seem a subject that would lend itself well to a presidential address, the outcomes of this work have led to the emergence of “fractal” objects that appear to have a natural beauty. Could such objects be said to be “art” and can the underlying mathematics start to describe art? In order to understand fractals, it is useful to consider “deterministic chaos”, a subject which is often associated with the “butterfly effect”

Chaos

The Weather

In 1814, Laplace, Figure 1, published an essay in which he made the following proposition:

“We may regard the present state of the universe as the effect of its past and the cause of its future. An intellect which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed … for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes.”

Institutively, this would seem to be reasonable. However, during the 20th century, it was shown that the behaviour of most deterministic systems cannot be predicted. In such systems, minute uncertainties in their initial conditions appear to make any such predictions completely inaccurate. This was first shown to the case for weather forecasting by Edward Lorenz, a professor at the Massachusetts Institute of
Technology following service as a weather forecaster for the United States Army Air Corps.

In 1956, Lorenz tried to formulate a model for the atmospheric system, which would have included temperature, pressure, etc.; such a model might form the basis for weather forecasting. He developed this simple model on a computer using a small system of interrelated equations. The model seemed to produce reasonable results but he discovered that even small changes in the starting conditions gave very different forecasts. Wishing to re-examine some of his earlier studies, Lorenz retyped data back into the computer and set it off again running the same simulation. The original data was calculated to six significant figures (e.g. 0.722143), but, to save time, Lorenz only typed the data back in to three significant figures (e.g. 0.722). Since observations of meteorological data would not normally be more accurate than about 1%, this seemed to be quite reasonable. An example of this is shown in Table 1, using similar equations to those of Lorenz. The same initial value is chosen in each forecast, but in the second case (last column) is only stated to 3 rather than 6 significant figures. It can be seen that this small error (shown underlined) very quickly dominates the forecast until by the 11th day, the numbers forecast are entirely different.

Lorenz concluded that minute variations in initial values in his computer model resulted in highly divergent weather forecasts. It also meant that long-term weather predictions are not likely to be accurate. He was attributed with saying, “Can the flap of a butterfly’s wing stir up a tornado in Texas?” and so this sensitive dependence on initial conditions came to be known as the “butterfly effect”.

Graphs showing “attractors” may be used to show the next state of a deterministic system when the previous state is known. For example, Figure 2 shows an attractor for a child’s toy swing. The swing is pulled to one side and is therefore higher off the ground. At the point it is released it has zero velocity, it then acquires a higher velocity but decreases in height. At the bottom of its swing, it has the highest velocity, but lowest height. Gradually the swing slows down due to air resistance.

When the system exhibits the butterfly effect, the attractor is known as a “strange attractor”, a term possibly coined by the mathematicians, Floris Takens (1940 – 2010). In this case the attractor has an infinite amount of detail. The attractor for the Lorenz system of equations is shown in Figure 3, and it can be seen that the “next state” of the system is crucially dependent on the “previous state” – a slight change in initial state could result in following a completely different path on the attractor.

<table>
<thead>
<tr>
<th>Forecast period</th>
<th>Forecast starting with 6 sig. figs</th>
<th>Forecast starting with 3 sig. figs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>0.722143</td>
<td>0.722??</td>
</tr>
<tr>
<td>After 1 day</td>
<td>1.324100</td>
<td>1.324000</td>
</tr>
<tr>
<td>After 2 day</td>
<td>0.036675</td>
<td>0.036488</td>
</tr>
<tr>
<td>After 5 day</td>
<td>1.259331</td>
<td>1.257214</td>
</tr>
<tr>
<td>After 10 day</td>
<td>1.255728</td>
<td>1.309731</td>
</tr>
<tr>
<td>After 11 day</td>
<td>0.292351</td>
<td>0.092738</td>
</tr>
</tbody>
</table>

Table 1: Example error propagation in weather forecast
It seems therefore that, even deterministic systems, whilst they may be predictable in the short term, they may be totally unpredictable in the long term, if they have a sensitive dependence on initial conditions. Determinism does NOT therefore imply predictability and Laplace’s demon would not be able to gaze very far into the future of the universe. One might argue that this may be possible if the initial conditions were known with infinite accuracy. However, Heisenberg’s uncertainty principle would preclude this since it states that the product of the uncertainties of the momentum and position of a particle must be finite (greater than $1.05 \times 10^{-34}$ J.s).

**Music**

It is notable that there are some similarities between music and chaos. In many cases, one may be able to guess how a piece of music may progress, perhaps for the next few bars; indeed if it were totally random and unpredictable then it would be without any form or order and could not be classed as music. On the other hand, if it were totally predictable for the whole of the rest of the piece, then it would quickly become boring and uncreative. Music therefore needs to have a balance between short term predictability (perhaps with some surprises) and longer term unpredictability. Perhaps the first composer to attempt to represent chaos (at least in the sense of being without form) was Joseph Haydn in the opening of Die Schöpfung (The Creation) where disguising of cadences and the use of chromatic harmonies instigates a feeling of disorder and confusion.

**Population Dynamics**

Populations are known sometimes to increase and decrease cyclically, without seemingly reaching a steady state. There is a mediaeval parable that illustrates this:

*This year there are a lot of mice in the fields … The mice eat the grain, the farmers are concerned for the harvest … This results in a period of very poor dowries, which leads to many more old maids … They all tend to love cats, so the number of cats increases rapidly That in turn is bad for the mice population, it rapidly decreases: This makes for happy farmers and very rich dowries, very few old maids, very few cats and therefore Back come the mice!*

Clearly the size of a population may depend on a lot of factors, (food supply, space, climate, predation, fertility, etc.), but Verhulst, Figure 4a, showed that a straightforward equation can be used to represent simple population dynamics:

The equation Figure 4b simply shows next year’s population as a function of this year’s population; all the factors are collected into one term: “$r$”, which can have a value between zero and four.
The equation simply shows next year’s population as a function of this year’s population; all the factors are collected into one term: “r”, which can have a value between zero and four.

Laplace would probably therefore have conjectured: “... so surely we can work out what the population does next year, the year after that, the year after that, and so on infinitely far into the future.” Surprisingly for such a simple equation, this turns out not always to be true. Indeed, it turns out that:

For r less than 1: the population becomes extinct
For r between 1 and 3: the population stabilizes
For r between 3 and ~3.4: the population oscillates

However, for values of r greater than approximately 3.4, the population exhibits chaotic behaviour and it is not possible to predict the population dynamics with any certainty.

The mathematician Mitchell Feigenbaum (1944 – ), using a small HP-65 calculator, demonstrated this by attempting to calculate the final population (x) for different values of r. His result, known as a bifurcation diagram, is shown in Figure 5. The single line for values of r less than 3 shows that the population stabilises at a constant value.

The diagram has some interesting features that are beyond the scope of this talk; these include the discovery of a new universal constant, the first Feigenbaum constant, which relates the values at which such successive period-doubling bifurcations occur. The diagram also displays “self-similarity”. A close inspection of the parts of the diagram (for example that part within the square in Figure 5) reveal another Feigenbaum diagram (in this case inverted.) Like the Lorenz attractor, the Feigenbaum bifurcation diagram has infinite detail, and indeed contains an infinite number of copies of the Feigenbaum bifurcation diagram within itself.

Magnetic Pendulum

A final example of chaotic behaviour is that of the “magnetic pendulum”. This comprises a pendulum with an iron bob, which is attracted to three magnets situated on the surface underneath the bob, see Figure 6.
The magnetic pendulum is sometimes used as a game, the object being to guess over which magnet the pendulum will eventually come to rest. For some starting positions, this is not difficult, but for others the behaviour of the pendulum, whilst being controlled by well-understood physical principles, becomes chaotic and highly dependent on the exact starting position. A “map” can be drawn to show this, Figure 7. In this case the magnets are colour coded black, grey, or white. If the pendulum starts anywhere over a black region, it will end up stopping above the black magnet, etc. These so-called “basins of attraction” become infinitely detailed further away from the magnets and an infinitesimally small change in starting position causes the pendulum to stop over a different magnet.

![Figure 7: Basins of attraction for a magnetic pendulum](image)

**Fractals**

Before trying to define a fractal, it is useful to consider a paradox, known as the coastline paradox. We start with a seemingly straightforward question So “straightforward” that it was asked on the BBC’s “University Challenge” programme over Christmas 2011. “How long is the coastline of Britain?”

The coastline paradox states that a coastline generally does not have a well-defined length; it depends on the “wiggliness” of the coast. If the length is estimated from a map using a large ruler, e.g. Figure 8(a), then many of the wiggles are not included. In this example, about 12 lengths of a 200 km ruler are required yielding a total coastline length of 2400 km. As smaller rulers are used, figures (b) and (c), longer total lengths of coastline are estimated.

![Figure 8: Estimating the length of Britain’s coastline using rulers of different lengths](image)

A graph showing the estimated length of Britain’s coastline as a function of the length of ruler used to measure it, is shown in . Note that an infinitely short ruler would result in an infinitely long coastline!

<table>
<thead>
<tr>
<th>Country</th>
<th>Coastline (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>202,080</td>
</tr>
<tr>
<td>Norway</td>
<td>25,148</td>
</tr>
<tr>
<td>Greece</td>
<td>13,676</td>
</tr>
<tr>
<td>Great Britain</td>
<td>12,429</td>
</tr>
<tr>
<td>France</td>
<td>3,427</td>
</tr>
<tr>
<td>Monaco</td>
<td>4</td>
</tr>
</tbody>
</table>

*Table 2: Length of coastlines of selected countries*

Lengths of coastlines of a selection of countries taken from The World Factbook of the CIA are shown in. The Ordnance Survey has estimated the coastline of Great Britain to be 11,072.76 miles or 17,819.88 km rather than the 12,429 km quoted by the CIA.
Figure 9: The length of Britain’s coastline as a function of the length of ruler used to measure it

From this it can be estimated that the OS must have used a 2 m long ruler for their estimates, whereas the CIA used one that was 5.64 m (probably 18.5 feet) long.

Fractals and defining the size of things

The length of Britain’s coastline has proved elusive to quantify. Indeed, it seems by one measure, that it could have an infinitely long coast; although clearly the area of the country is finite (it is possible to draw a map on a finite size of paper.) The Feigenbaum bifurcation diagram (Figure 5) contained copies of itself within itself – and copies within copies. The Lorenz attractor, Figure 3, and the basins of attraction for the magnetic pendulum, Figure 7, both contained infinite amounts of detail since a slight change in initial conditions led to an entirely different behaviour of the system that they were describing. One is led to the rather uncomfortable conclusion that it is not straightforward to measure the size of these objects – how big are they? In “normal” Euclidian geometry (Figure 10), figures occupy 2-dimensional space: the size – i.e. the area – of a figure is proportional to its length squared – i.e. raised to the power 2. The size (i.e. the volume) of an object – a 3-dimensional object – is similarly proportional to its length cubed – i.e. raised to the power 3. One could talk about lines having a dimension of 1, figures a dimension of 2, and objects a dimension of 3. All of these dimensions are integers – i.e. whole numbers.

However, it can be shown that the dimension of Britain’s coastline is approximately 1.25 and that of the Lorenz attractor is 2.06. Indeed it can be shown that the dimensions of many naturally occurring objects are non-integer. The mathematician Mandelbrot, coined the term “Fractals” (from the Latin adjective fractus) for these objects that have a fractional dimension and that display “self-similarity” (such as the Feigenbaum bifurcation diagram, ). His book on the Fractal Geometry of Nature is well worth reading.

Fractal shapes (although not necessarily defined as such) have been of interest to mathematicians since at least the late 19th century. It is worth presenting one of these, the Koch Curve, before discussing naturally-occurring fractals.

The Koch Curve and Snowflake

Helge von Koch, Figure 11, a Swedish mathematician, was interested in trying to find a curve that could not be differentiated – i.e. which did not have a defined slope. In doing so he described one of the earliest known fractals, the Koch curve, which is sometimes developed into the Koch “snowflake”.

Figure 10: Dimensions in Euclidian geometry

Figure 11 Niels Fabian Helge von Koch (1870 - 1924)
The Koch curve is generated as shown in Figure 12. The middle third of a straight line is removed and replaced with two more straight lines to form an equilateral triangle with the third that was removed. The same procedure is repeated on the resulting four straight lines. This procedure is iterated an infinite number of times resulting in an infinitely long line of indeterminate slope.

Figure 12: Construction of the Koch Curve

Note that the curve possesses the characteristic of self-similarity, since each section of a Koch curve is another Koch curve. One may be reminded of the poem by Jonathan Swift:

So, naturalists observe, a flea
Has smaller fleas that on him prey;
And these have smaller still to bite 'em;
And so proceed ad infinitum.

Koch’s snowflake is generated in a similar way to give a snowflake-like object, Figure 13. Rather like the coastline paradox, it can be shown that this has a finite area, but an infinitely long perimeter. It has a fractal dimension of 1.262.

Figure 13 The Koch Snowflake

Natural Fractals

There are many examples of naturally occurring objects that have fractal-like characteristics.

Figure 14 shows a naturally occurring fern (fossil) and a computer generated fern. Note the self-similarity of the fronds and sub-fronds to the fern itself.

Figure 14: Fractal ferns

Ammonites, Figure 15, are known to follow the shape of a logarithmic spiral. There is some debate about whether logarithmic spirals are really fractals. They are self similar, since a part of a logarithmic spiral is another logarithmic spiral after rotation and their dimension is poorly defined.

Figure 15: Ammonites and logarithmic spirals
The florets of a cauliflower look just like a whole cauliflower, Figure 16, and thus also demonstrate self-similarity. Indeed, every floret carries around 13 sub-florets, which are 3 times smaller. On this basis the fractal dimension of a cauliflower is 2.33 (=log(13)/log(3)).

Figure 16: Cauliflowers show self-similarity

Clearly, if a cauliflower is subdivided too much, it loses its fractal properties. In practice, all “real” objects (unlike their mathematical counterparts) only have fractal properties over a limited range of scale. Clouds are thought to be the natural objects that are “most fractal” in this respect, the edges of clouds display fractal behaviour over a range of more than a million to one with a typical fractal dimension of 1.16.

Trees can also be described by their fractal dimension, Figure 17. Trees in which the branches can be clearly seen tend to have a fractal dimension between 1 and 2, whereas very bushy trees, whose structure cannot be clearly seen in a photograph, have fractal dimensions between 2 and 3. Also shown in Figure 17 is an “electrical tree” – a form of electrical breakdown – in epoxy resin. Knowing the fractal dimension enables a prediction of the time to failure.

Figure 17: Tree – An “Electrical Tree

It is clear that the blood circulatory system (e.g. in a kidney) and similarly the respiratory system in the lungs, are analogous to the fractal images seen above. An infinite (very long) length with a finite volume would be advantageous in blood vessels and the bronchial system for maximising the surface area for transfer of chemicals between the fluid and the surrounding tissue. Gil et al, in considering the dog kidney, have noted that “Fractal geometry provides many advantages when examining the complex microscopical images of natural objects.”

Relating Fractals and Chaos

Julia Sets

Gaston Julia was one of the forefathers of modern dynamical systems theory. As a French soldier in WW1, he had been severely wounded and lost his nose. Between painful operations, he carried on his mathematical research in hospital. Julia looked at “iterative functions” – rather like the Verhulst population equation described above. In these equations, the “next” value of a variable is described in terms of the current value. For example, a simple iterative function would be:

\[ x_{\text{next}} = x_{\text{current}}^2 \]

- meaning that the next value of \( x \) is the square of the current value of \( x \). Julia talked about “prisoners” and “escapees” (perhaps as a result of his wartime experience.) In the above equation, if the current value of \( x \) is greater than 1 then the expression “escapes” to infinity. For example, if \( x_{\text{current}} = 2 \), then the subsequent values of \( x \) are 4, 16, 256, 65536, 4294967296 and it can be seen that this tends to infinity. However, if the current value of \( x \) is less
than 1 then the value is said to be a prisoner. For example, if $x_{current} = 0.5$, then the subsequent values of $x$ are 0.25, 0.0625, 0.00390625, 0.0000152587890625, 0.00000000023283064365387, 0.0000000000000000542101086242752 and the values quickly diminish towards zero.

The Mandelbrot Set

Perhaps the most well-known fractal is the representation of the Mandelbrot set. Mandelbrot effectively catalogued the Julia sets by finding which values of “c” in Julia’s equation gave connected sets and which gave disconnected sets. He was then able to plot a graph to showing the border of values of “c” separating connected and disconnected Julia sets. This graph is the Mandelbrot set, and perhaps does not look very inspiring in its basic form, Figure 19.

Along the edges of the Mandelbrot set can clearly be seen more Mandelbrot sets and one can “zoom in” infinitely far and see further versions of the same set. Again, there are many fine images of this set that are easy to find on the internet. Many of these are colour enhanced to indicate the distance from the boundary, Figure 20.
An amazing movie zooming into the Mandelbrot set is available at: http://www.youtube.com/watch?v=0jGaio87u3A

Fractals and Chaos in Art and Films

Whilst it is debateable whether such fractals constitute “art” in the true meaning of the sense, art has been analysed for self-similarity and fractal dimension.

Jackson Pollock

Jackson Pollock (1912 – 1956) was an influential American painter and a major figure in the abstract expressionist movement who enjoyed considerable fame and notoriety. Whilst he was regarded as a mostly reclusive artist, he had a volatile personality, and struggled with alcoholism for most of his life. From the 1940s, Pollock would lay a canvas on the floor of his barn and flick and drip paint on it week after week building up layers and layers of paint. Figure 21 shows the start of such a painting.

An analysis by Taylor et al, published in Nature suggested that he improved his technique as the fractal dimension of his painting increased from near 1 in 1943 to 1.72 in 1953. They further suggest that, because the fractal dimension follows such a distinct evolution with time, it could be used as a quantitative objective technique both to date and validate Pollock’s paintings.

Fractals in Films and Electronic Games

Fractals are now widely used in animated films and where backgrounds may have been “painted in” in the past. A typical background of a mountain view covered in trees can be produced relatively easily using fractal – based computer programs. Because of the infinite detail available using fractals, the producer can zoom into wooded areas in such landscapes without any loss of realism. Using the rules of repetition and self-similarity, rocks, clouds and forests can easily be created. The realism achieved demonstrates the power of maths to describe the complexity of nature.

Fractals and Chaos in Music

The relationship between music and chaos has already been alluded to. Professor Andrew Hugill, of De Montfort University is to give the last lecture of this year on April 23 2012 on the subject of “Making Music with Computers: how I wrote certain of my works.” The use of generating music using the principles of fractals and chaos is probably in its early days. After a visit to the Todaiji (“Great Eastern Temple”) in Nara near Kyoto, the author was inspired to try to “compose” some music based on the Mandelbrot set. The music is set for drums and
gongs, and bells to mimic the wind chimes (“Fuurin”) found in such temples. The music is supposed to represent the wind increasing and causing the chimes to play over a background of drums. It is written in a pentatonic scale to give a feeling for the country. It can be downloaded from:

http://www.littleurl.net/7abf3b

Concluding remarks

Whether art and music can really be generated by mathematical techniques, and whether they can be described by the mathematical principles underlying chaos and fractals, are still moot points. Mathematicians often argue that their subject has an innate beauty, which may be hidden from those without a reasonable understanding of the subject. Whether or not this presentation has demonstrated the potential for chaos and fractals to bridge the gap between science and art, it is hoped that it has unveiled some of the beauty of mathematics and its ability to describe the complexity of the natural world.

CHARLES DICKENS AND THE ANATOMY OF MURDER

Dr Andrew Mangham
Lecturer in Victorian Literature and Culture, University of Reading

Lecture delivered on 17th October 2011

In 1865 the pioneering French physician Claude Bernard published his Introduction to the Study of Experimental Medicine, a book that cemented physiology’s authentication as a branch of scientific research. Yet unlike chemistry and physics, medicine dealt with living materials. Since the days of Hippocrates, the field had made a vow to prioritise the health of patients which meant that medicine was a palliative science rather than research one. Experimentation could be only a secondary motive and – even then – there were moral objections to thrusting the ‘knife here and there, to see what would come of it’. Logistically, there was the related problem of getting objects to study. Dead bodies were hard enough to come by at the start of the century; living bodies (for experimentation) virtually impossible. Cases did not present themselves with any level of frequency. If a doctor wished to experiment on, say, a suppurated abscess, he would need to wait until a patient presented him- or herself with that condition and, naturally, not many would be willing to be experimented on at the possible cost of recovering quickly and fully.

Benjamin Brodie, a prominent medical figure and follower of surgeon John Hunter’s methods, aimed to get around this problem using vivisection. He was later given a baronetcy for his services to anatomical medicine and is remembered often as the physician who read The Pickwick Papers between visits to his patients. He was an avid experimentalist and his vivisections appeared to endow medicine with the kind of accuracy that people had come to expect from the inorganic sciences. Around 1820 he was told the story of a teenage boy named William Claridge who had attempted to hang himself. He was cut down before he died, lingered for some time, then died. Cases like this got Brodie thinking about how long a person could be suspended by the neck before he or she went beyond the point of recovery. Having amassed copious notes in relation to a number of cases like Claridge’s, he decided to try some experiments and he hanged a few dogs. John Forsyth, author of A Synopsis of Modern Medical Jurisprudence, said that, without Brodie’s efforts, medicine would not be aware that it was sometimes possible for ‘the person to recover from the […] consequences of hanging’, when hope seemed pointless.
In his excellent book, Vital Signs (1992), Lawrence Rothfield linked ‘the displacement of one genre (realism) by another (naturalism) by correlating it with the displacement of one form of scientific thought (that of clinical medicine) by another (that of experimental medicine)’. What I would like to consider is how this correlation, though expressed most forcefully in the writings of Émile Zola, predated the advent of naturalism and served as inspiration for the narrative trajectories of Nicholas Nickleby. Experimental methods like Brodie’s vied with empirical medicine for disciplinary accuracy from the end of the eighteenth century onwards. The resulting clash of epistemologies allowed Dickens to incorporate the experimental method into his third novel.

In his well-known essay ‘The Experimental Novel’ (1880), Zola leaned heavily on Bernard’s work in order to lay out a manifesto for his vision of naturalism. His main idea was that the experimental method should be incorporated into the writing of fiction. He ‘developed’, according to Rothfield, ‘a full-blown literary and intellectual persona of the writer as scientist’. Closing his essay, the Frenchman noted:

Our field is the same as the physiologist’s, only that it is greater. We operate, like him, on man. [...] The metaphysical man is dead; our whole territory is transformed by the advent of the physiological man. [...] We have become experimentalists instead of philosophers.

Zola continued to outline exactly how an author should be experimental with his subject: he should isolate a character and study, through his writing, that individual’s reactions to other characters, events, scenes, and so on.

Although Zola developed all his examples from French literature, he could have turned towards Dickens’s characterisation of Nicholas Nickleby as an example of an author experimenting with his protagonist. As Rothfield notes, Zola ‘is by no means alone among nineteenth-century writers in claiming to treat his characters as a doctor treats his patients. Similar sentiments are expressed [...] by a range of realists, including Dickens’. Dickens adopted the experimental method and performs a number of ‘tests’ with his hero as a common, yet reagent, variable. Indeed, Nicholas’s character is a complex and brilliant method of allowing the author to shed light during the novel’s more polemic scenes. In his 1848 preface to the novel Dickens noted:

If Nicholas be not always found to be blameless or agreeable, he is not always intended to appear so. He is a young man of an impetuous temper and of little or no experience; and I saw no reason why such a hero should be lifted out of nature. (pp. xlvii-xlvi)

In other words, Nicholas must get his boots dirty if his characterisation is to be in any way instructive. He is the means through which the novel offers an exposé of the world the hero inhabits. In not lifting Nicholas ‘out of nature’, Dickens effectively subscribes to the experimental method as it would be defined by Brodie, Bernard and Zola. Nicholas needs to remain inside the very picture he is revealing. And he needs to react.

Throughout the novel Nicholas shows that he is indeed of ‘impetuous temper’; he is often violent and passionate and, despite his reactions being justified more often than not, his anger – ‘the wrath of Nicholas’ (p. 374) – becomes proverbial as the story develops. After knocking down Mr Lenville, the tragedian from the company of Mr Crummles, he says: ‘Be careful, sir, [...] another time; [...] be careful [...] to ascertain your rival’s temper’ (p. 350).

Rather than this being a characteristic that prevents the reader from warming to the hero, Nicholas’s passions allow Dickens to make some powerful and significant observations – particularly with reference to Yorkshire schools. We know from the preface, plus the research into the author’s interest in William Shaw and Yorkshire schools undertaken by Michael Slater, that the first stages of the novel were meant to ‘[call] public attention to the system’ of northern schooling (p. xlii). As with the scenes of squalor and mistreatment that Dickens exposed in his other works, Nickleby included passages that were intended to expose grim and hidden ‘truths’. His aim was to turn his powerful observations upon such scenes and, importantly, it is the reagent nature of Nicholas that facilitates his novel’s rallying success.

On the day that Smike is returned to the schoolroom and is about to be beaten, Nicholas explodes quite dramatically. In the build-up to that scene, Dickens
draws a pathetic portrait of the harrowed Smike who appears half-dead, emaciated and not unlike a cadaver arriving to be dissected:

The very first object that met [Nicholas's] eyes was the wretched Smike: so bedabbled with mud and rain and worn and wild, that, but for his garments being such as no scarecrow was ever seen to wear, he might have been doubtful, even then, of his identity. [...] With hands trembling with delight, Squeers unloosened the cord; and Smike, to all appearance more dead than alive, was brought into the house and securely locked up in a cellar until such time as Mr Squeers should deem it expedient to operate upon him, in presence of the assembled school. (pp. 140-41).

Smike embodies the awful reality that Dickens was eager to show his readers. What follows is an explosion equal to one that might be caused by experimenting with highly volatile materials:

Squeers caught [Smike] firmly in his grip; one desperate cut had fallen on his body – he was wincing from the lash and uttering a scream of pain – it was raised again, and again about to fall – when Nicholas Nickleby suddenly starting up, cried ‘Stop!’ in a voice that made the rafters ring. [...] 

‘Sit down, beggar!’ screamed Squeers, almost beside himself with rage, and seizing Smike as he spoke.

‘Wretch,’ rejoined Nicholas, fiercely, ‘touch him at your peril! I will not stand by, and see it done. My blood is up, and I have the strength of ten such men as you. Look to yourself, for by Heaven I will not spare you, if you drive me on!’

‘Stand back,’ cried Squeers, brandishing his weapon.

[...] ‘Have a care; for if you do raise the devil within me, the consequences shall fall heavily upon your own head!’

He had scarcely spoken, when Squeers, in a violent outbreak of wrath, and with a cry like the howl of a wild beast, spat upon him, and struck him a blow across the face with his instrument of torture, which raised up a bar of livid flesh as it was inflicted. Smarting with the agony of the blow, and concentrating into that one moment all his feelings of rage, scorn, and indignation, Nicholas sprang upon him, wrested the weapon from his hand, and pinning him by the throat, beat the ruffian till he roared for mercy. (p. 142-44).

Although the narrative’s focus is on Nicholas’s trouncing of Squeers, our sympathies for Smike and hatred of the schoolmaster are in no way diminished by the violence. Indeed, Nicholas’s passions are executed carefully so that they fire the sense of justice being done. In anticipation of the science of Bernard and the literary theory of Zola, then, Dickens introduces a reactive agent (Nicholas) into a certain environment as a powerful way of highlighting the realities of that scene and of kindling new sympathies from his readers. What this demonstrates is that Nicholas is Dickens’s main component in testing how far a reactive and passionate hero might highlight certain ‘realities’ by acting as the text’s volatile catalyst.
Introduction

Chances are, you have your father’s surname, or at least were born with it. Indeed, for most people the surname that they carry is not only that of their father, but the same surname that has been passed down through their family for generations. As they are passed down from fathers to children, surnames have come to signify families and, over the generations, male-line dynasties. This raises the question then: what about men who share a surname but don’t know themselves to be related? Could it be that they share their surname because they share a paternal ancestor who could have lived many hundreds of years ago? Fortunately, a question that once had genealogists hunting for the paper trail can now be answered following advances in the field of genetics.

Hereditary surnames in Britain

The practice of using hereditary surnames was brought to Britain by the Normans, following the invasion of 1066, where family names had been in use by the aristocracy for a couple of generations. As in Normandy, the Norman lords here used them as a way of solidifying claims to land and therefore the first hereditary surnames were often derived from place-names. First adopted by the wealthy land-owning families, the use of hereditary surnames gradually filtered down to the rest of the population and became commonplace in the south before it did in the north of the country. For many years, however, people still had non-hereditary bynames and it wasn’t until 1350A.D. that many families had surnames with it becoming rare not to have a surname by 1500A.D.

As people began to take on surnames they came from a variety of sources broadly grouped into six categories. Many surnames derive from first names, usually from a father, giving us surnames such as Johnson and Roberts. Other surnames derived from a person’s occupation (Smith, Thatcher), locative surnames from a place (Soulsby, Lancaster), from topographical features of the landscape (Church, Bush), from nicknames (Crowe, Brown) or from a relationship (Cousins). Here any surname in your family tree carries a story about a feature of an ancestor’s life.

Two interesting characteristics of surnames are their large overall number and their individual rarity. The 1881 census listed over 400,000 surnames, a number which is thought to be even greater now mostly as a result of recent immigration. Perhaps unsurprising then is the fact that most surnames are rare: the most frequent 500 surnames are carried by ~45% of the population meaning that the vast majority of surnames have only a small number of carriers. Indeed the average number of carriers for a surname is around 70 people. Finally, while some surnames (particularly the common ones) are found across the country, many surnames have a ‘home’ where the surname originated many hundreds of years ago. Thus a person’s surname often contains within it information about where his or her family originated.

The Y chromosome

So how do we marry the fields of surname history and genetics? The nexus arises in the form of a particular piece of our DNA: the Y chromosome. While the majority of our DNA is a mixture of that of all our ancestors, the Y chromosome is unusual. It has on it the gene which acts as the switch sending a foetus down the path towards maleness and therefore, unlike the rest of our genetic material, it has a simple pattern of inheritance being passed down the male line virtually unchanged through the generations. As the Y chromosome is being copied during the
formation of sperm, errors do occur in the copying mechanism introducing tiny mutations in the DNA sequence. We geneticists like these little mistakes. They provide us with a way to tell Y chromosomes apart: a man’s Y chromosome will contain within it all the mutations that have arisen in his particular paternal lineage and these will differ from the mutations that have arisen in another man’s lineage. You will also have noticed that the passage of the Y chromosome mirrors the passage of a surname down through the generations leading to the question: is there a link between a surname and a Y chromosome type? Could it be that all men with the same surname share the same Y chromosome type?

The link between surnames and the Y chromosome

Studying the link between British surnames and Y chromosome type has been the focus of my research for many years. At the outset it could be surmised that, at least for common surnames, it was unlikely that there would be a simple link between a surname and a single Y chromosome type. For surnames such as Smith, from the occupation of blacksmith, and with the likelihood of there being a blacksmith in most towns and villages, the surname would have been taken on a number of different times by different men, all with their own individual Y chromosome types. But what about rare names? As we know most surnames are rare: did they have just one Y chromosome type associated with them; that, presumably, of the original founder several hundred years ago? Surnames in Britain can be said to have an average age of 700 years: would we still find a link after all this time? Surely events such as illegitimacy (where a child would have one man’s surname but another man’s Y chromosome) or adoption, or inheriting the mother’s surname would break the link between a surname and a Y chromosome type. Other factors will affect the types of Y chromosome associated with any one surname today. Genetic drift, the difference in the number of male offspring that men have, means that some men will have many sons, passing on their surnames and Y chromosomes many times whereas, at the other end of the spectrum, other men will have no sons to carry on their surnames and Y chromosome types: a phenomenon known as ‘daughtering out’ in genealogical circles. Finally, we know that tiny mutations would have occurred on the Y chromosomes in a true lineage over time which would have to be taken into account. How would all these factors affect the types and number of Y chromosomes types associated with a surname? We really didn't know what we would find.

The surnames' studies: the ‘pairs’ and 40 surnames studies

The first step was to do a ‘pairs’ study asking the question: what do we find when we take two men at random from around the country with the same surname but who don’t know themselves to be related? Do they also have the same Y chromosome type; both their surname and Y chromosome type being descended from the same ancestor? To carry out the pairs study, surnames were chosen from across the frequency spectrum, from very common names (Smith) down to lower frequency names (Rivis – with only 50 people carrying this surname in Britain). 150 pairs of same-surnamed men were collected and their Y chromosomes analyzed and it was found that overall, 24% of the pairs appeared to share a common ancestor through their surname. Given that we expect common names to have more than one founder (and so two men taken at random with a common name might not be expected to have inherited their surname and Y chromosome from the same ancestor) it was interesting to look at the lower half of the frequency spectrum where surnames are more likely to have had a single founder: here just under 50% of the pairs had results consistent with them sharing a common ancestor through their surname.

This was fascinating: despite the length of time since surnames were established and all the factors that could affect the link between surname and Y chromosome a link existed and that link was stronger the rarer the name. An in-depth study of 40 surnames (with known spelling variants) then followed where many men with the same surname, but who did not know themselves to be related, were recruited. A similar pattern was seen. Among the common names, very few men appeared to be related. However, when looking at middle frequency surnames, ‘descent clusters’ began to appear: groups of men with the same surname (or with surname spelling variants) who had identical or near identical Y chromosome types suggesting that they all shared a common
ancestor through their surname. The picture was even more striking among the rarer names. It was often the case that a single surname was dominated by a single Y chromosome type with related types. Here there were large groups of men who didn't know themselves to be related but the genetics proved that they all shared a common ancestor through their surname. Perhaps the best example in my set of 40 surnames was the surname Attenborough (with the spelling variant Attenborrow). Here I had 31 randomly sampled Attenborough/Attenborrow men from around the country, including Sir David Attenborough who was kind enough to take part in the study, who did not know themselves to be related. Out of these 31, 27 of them had identical or near identical Y chromosome types: they all must form part of an as-yet-to-be constructed family tree. Thus both studies gave the same result: a strong link exists between surname and Y chromosome type with the link being stronger the rarer the name.

Implications

Catching the bad guys – surnames and forensics

Given this strong link between surnames and Y chromosomes, it might be possible to predict a surname from a Y chromosome type and therefore be applied in forensic investigations. Using the pairs data above as a pilot set, we tested this theory. Our experiments showed that it was possible to predict the correct surname from the Y chromosome type alone in 34% of cases suggesting that this method could be of use to the police as an investigative tool. Using a large database containing surnames and their accompanying Y chromosome types, police could take the Y chromosome profile from a crime scene and run it against the database looking for any matching Y chromosome types and associated surnames. When combined with other information, such as that the perpetrator must have had local knowledge, the resulting list of surnames could be used to prioritise interviews from an existing suspect list or used to generate a suspect list. However, it is important to remember that this new tool could only be of investigative use and could not be used as evidence. Once the police felt they had the perpetrator, the standard DNA profiling methods used in forensics would have to be used. Interestingly though, such a database could have a deterrent effect: it is not necessary for the perpetrator himself to be on the database, merely someone else with the same surname.

Genetic genealogy and deep ancestry

As mentioned at the beginning this link between surnames and the Y chromosome has proved to be a tremendous boon to genealogists giving rise to a new branch of genealogy known, perhaps unsurprisingly, as genetic genealogy. It allows them to test whether or not families thought to be related are indeed so when they cannot find the paper trail to link the two. While the genetic information cannot tell them when it was they shared a common ancestor, it can tell them if it was likely to be within a certain number of generations. People are able to use genetics to prioritise which links to research and find long lost family members.

One of the interesting characteristics of the Y chromosome is its geographical localization: that is there are different types of Y chromosomes in different parts of the world. It is possible to determine a man's Y chromosome type and say something broadly about where his ancestry lies – certainly at a continental level. Within Europe, we often find that the same Y chromosome types are found across the continent but at differing frequencies in different regions. That is not to say that should a man possess a Y chromosome type that is found at high frequency in a certain region then his ancestry definitely comes from that area, it merely makes it more likely. This can make for some unexpected results: some bearers of the surname Rivis found through participating in my study that they carried a Y chromosome type that is known to be very rare and only found, so far, in northwest Africa. The most likely route for this Y chromosome type arriving in this country, and becoming associated with the surname, is through the slave trade.

The genetic legacy of the Vikings

The link between geographically localized surnames and the Y chromosome is now being used as a way to explore the genetic legacy of the Norwegian Vikings in the north of England. We know from contemporary chroniclers and archaeological and place-name evidence that the Vikings arrived in
England in the late 8th century A.D. and that over time they began to settle here. As geneticists, we wish to know how much they contributed genetically to the population; however since this time there has been population growth and migration. By simply sampling men alive today we are likely to get a very blurred picture of the genetic contribution of the Vikings. Given the difficulties of carrying out ancient-DNA studies on, for example, skeletal material from the period, a third way arose: what if we were able to use surnames as a time-machine? Though the Norwegian Vikings did not have heritable surnames themselves, sampling men with old surnames from the region makes it more likely that their male line ancestor lived there several hundred years ago, not long after the Vikings arrived. By looking at the Y chromosome type of a man with, for example, an old Cumbrian surname, I am hopefully looking at an old Cumbrian Y chromosome type. Thus we are getting closer to the genetic composition of the population in the past.

Indeed this method does seem to work. A small study was carried out in the Wirral and West Lancashire where it was known that Norse Vikings arrived. Two different sample sets were chosen: one where we only required men to know their paternal ancestry for at least two generations in the area; the other sample group also required to know their paternal ancestry over two generations of residence but also carried old Wirral or West Lancashire surnames known from historical records to have been present there in medieval times. The Y chromosomes of these two groups of men were then analyzed and found to be very different: the analysis showed that the group with the old regional surnames showed much higher proportions of Norwegian ancestry. My current research seeks to extend this study across the north of England. I am currently collecting samples from men with old northern surnames from the Yorkshires, Durham, Northumberland, Cumbria, Lancashire and Cheshire.

Thus surnames and genetics are helping us to answer questions about our ancestors, who we are related to today, and the peopling of the British Isles.
The 1361 Act stated that “in every shire of England shall be assigned for keeping of the peace, one lord and with him three or four of the most worthy in the shire, with some learned in the law”. These justices were to “restrain rioters, and all other barrators, and to pursue, take and chastise them”. Not only did they have power to punish, they were required to take recognisances from citizens to guarantee their good behaviour – a power that has survived to the present day. Only a very robust institution could survive so long but is it strong enough to survive?

From the outset magistrates helped democratise the administration of justice. Through their independence and local connections they achieved what a centralised bureaucracy could not. They were effective and efficient. Despite being dominated by the middle classes and conservatives, they demonstrated a capacity to reflect social and economic change. Justices lie between the most powerful in society and the majority of the general population but proved adept in exploiting that middle ground and acting as a counter-balance to other powerful interest groups.

The work of the early Justice of the Peace was mainly administrative, enforcing economic regulations. There was not the clear distinction between judicial and the administrative acts. Those who had a duty to maintain bridges and roads in the local community and failed to discharge them were punished as those who infringed the criminal law. Justices themselves could be punished if they failed to attend court sessions. Local knowledge, access to resources and connections made magistrates effective not only in suppressing disorder but administering laws relating to trade and employment.

Justices were drawn from the landed gentry and the emerging middle classes of the towns, and played an important part in offsetting the power of the magnates and Sheriffs who held power in feudal times. Sheriffs, who were a Saxon creation, had become the King’s representative in the counties but proved inadequate in dealing with major unrest. The Justices, who were the principal inhabitants of the shire, successfully played a central role in the machinery of local government. They had a knowledge and understanding of those over whom they exercised their jurisdiction.

Whilst the magistracy was not a democratic institution by modern standards, it ensured that people other than the highest noblemen had a role in administering justice. The magistracy evolved into the current system whereby magistrates come from all backgrounds.

Advisory Committees, which recruit and recommend candidates for appointment to the bench, have worked in recent years to ensure the magistracy better reflects the population it serves. Almost eight percent of magistrates in 2010 were from ethnic minority groups – the same percentage of ethnic minority citizens recorded in the 2010 census. Fifty one percent of magistrates are women. People with
disabilities and blue collar workers are still underrepresented but magistrates are more diverse than many institutions.

The involvement of lay people in administering aspects of the criminal law – like Justices and jurors – is an important aspect of our democracy. Their involvement both increases the credibility and the public’s acceptance of the work of the courts. The involvement of citizens in the administration of justice is a deeply rooted Anglo Saxon tradition which sets us apart from most of the rest of Europe.

The courts apply the law but Justices are not professional lawyers and may lack technical expertise. The 1361 Act required Justices work with “some learned in the law”. Throughout history, Justices have employed clerks to maintain records and administer the courts. These clerks later took on the role of legal advisers. Initially Justices received direction on the law from Assize judges when they attended quarter sessions. Clerks to the Peace—often the Town Clerk in urban areas—were appointed to administer the quarter sessions.

By the 19th century it became common to employ a Justices’ Clerk to assist in petty sessions. These were lawyers, often in private practice, who worked part time. Part-time clerks continued to be employed until the 1970s when they were finally all replaced by full-time clerks.

Until the 1970s there were three levels of criminal trial court. Judges sat with juries in the Assize court dealing with the most serious indictments. Magistrates sat alone in Petty Sessions (Petty from the Norman French “small”) deciding on verdict and sentence on less serious matters. In the middle, Justices sat with Juries in Quarter Sessions which met quarterly. These courts eventually sat with qualified chairmen and latterly sat without Justices being present. Despite these reforms it became clear that the three tiered structure was not fit for its purpose. The 1966 Royal Commission chaired by Lord Beeching proposed a more efficient and economical court system. The resulting Courts Act (1971) abolished Quarter Sessions and Assizes and replaced them with Crown Courts. Although legislation did not have a direct impact on the magistrates’ court it marked a significantly reduced involvement of magistrates in the higher criminal courts. Magistrates now sit in Crown Courts to determine appeals.

Judges in the Crown Court provide an advisory role to magistrates through a Liaison Judge in each Local Justice Area; however Justices usually take their advice from Justices’ Clerks and their assistants. Whatever access Justices have had to legal advice over the years, they have always been free to ignore that advice as they are arbiters of law as well as fact. It may seem a strange that the lay judge is entitled to ignore the advice of the professional lawyer but the capacity for the Justices to do so is an important democratic device guaranteeing their independence. If magistrates make a legal error, their decisions can be overturned by the higher courts so correcting the capricious use of power.

The amateur status of magistrates was a cause for concern. In this passage from the Pickwick Papers, Charles Dickens depicts a Justice, Mr Nupkins, who, despite his bluster is totally dependant on his clerk Mr Jinks. At length the magistrate, gulping down his disinclination to hear anything more, turned with a very bad grace to Mr. Pickwick, and said sharply: “What do you want to say?”

“First,” said Mr. Pickwick, sending a look through his spectacles, under which even Nupkins quailed. “First, I wish to know what I and my friend have been brought here for?”

“Must I tell him?” whispered the magistrate to Jinks.

“I think you had better, sir,” whispered Jinks to the magistrate.

“I think you had better, sir,” whispered Jinks to the magistrate.

“An information has been sworn before me,” said the magistrate, “that it is apprehended you are going to fight a duel, and that the other man, Tupman, is your aider and abettor in it. Therefore—eh, Mr. Jinks?”

“Certainly, sir.”

“Therefore, I call upon you both, to—I think that’s the course, Mr. Jinks?”

“Certainly, sir.”

“To—to—what, Mr. Jinks?” said the magistrate, pettishly.

“To find bail, sir.”
“Yes. Therefore, I call upon you both—as I was about to say—when I was interrupted by my clerk to find bail.”

“Good bail,” whispered Mr. Jinks.

“I shall require good bail,” said the magistrate.

“Town’s-people,” whispered Jinks.

“They must be town’s-people,” said the magistrate.

Fifty pounds each,” whispered Jinks, “and householders, of course.”

“I shall require two sureties of fifty pounds each,” said the magistrate aloud, with great dignity, “and they must be householders, of course.”

At that time this caricature may have been accurate of some magistrates. Unfortunately it has survived in the mind of some that magistrates are merely marionettes. There is always a danger that a professional adviser to a lay judge might exert undue influence. During the second half of the 20th century the method of selecting and appointing magistrates was improved to ensure those appointed have the necessary qualities for the job. The selection process now involves a rigorous assessment against competences; attending compulsory training and regularly appraisals of their work by colleagues. Although some commentators still criticise the amateur status of magistrates (one talks of them as the “muppets on the bench”) most practitioners recognise that, working with their professional legal advisers, magistrates dispense justice very effectively; the rate of appeals from magistrates decisions remains low and their work continues to gain plaudits from the senior judiciary, e.g. the late Lord Bingham referred to the magistracy as a “democratic jewel beyond price”.

Another criticism of magistrates has been that they are prosecution minded. In the first half of the last century magistrates’ courts were known as police courts and until recently they were often housed in the same building. There are documented cases where magistrates made comments which suggested they were predisposed to the police. Unlike juries they give reasons for the verdicts they reach and the decisions they make. As they do not sit full time (on average they sit around 18 days a year), it makes it less likely that they will become biased and case hardened.

Magistrates are not under pressure to act in accordance with the wishes of the government which appoints them. Magistrates have always held office at the pleasure of the monarch. Throughout their history the sovereign sought to control them directly or through the Privy Council. Justices showed they were willing to ignore directions of the Privy Council where it suited them – for example they refused to enforce laws prohibiting the enclosure of land in the late 1480s, although this refusal was motivated largely by self interest. It is comparatively recently that they have had to be seen as apart and separate from the legislature and the executive.

Magistrates take great care not to express political views. This has not always stopped them from voicing their views where legislation appears not to work. Their opposition to the introduction of the unit fine in the 1990 was a major factor in persuading the government to abandon it. The judiciary is conscious of the importance of resisting pressure from the executive. When previous Home Secretaries exhorted magistrates to imprison fewer offenders because the jails were full, the prison population actually rose.

An independent judiciary is an essential part of a democracy. As magistrates’ courts deal with over 95% of all criminal cases and many family cases, they have a huge jurisdiction. Magistrates can do this because the public has been confident that they are independent but Judicial independence comes at a price. Magistrates and judges must refrain from political comment. Magistrates answer to the Monarch through the Lord Chancellor and to the higher courts for their individual decisions.

In 2005 the organisation of magistrates’ courts passed to a newly created agency, Her Majesty’s Courts Service. This Service is answerable to government ministers. Although magistrates’ and their clerks’ independence on judicial matters is preserved in statute, the new arrangements left magistrates open to potential interference from the executive.

Judges had long worked within a courts service which was centrally administered. The constitutional
basis for this is questionable. The Lord Chancellor was both a senior judge and a member of the Government. When the Constitutional Reform Act 2005 came into force, he gave up his judicial role and the majority of his judicial responsibilities were transferred to the Lord Chief Justice. A concordat between the judiciary and the Secretary of State for Justice (as the Lord Chancellor is now known), is underpinned by a network of judicial bodies which seek to protect the judiciary from interference and by ensuring it is properly resourced.

Magistrates have been far from popular over the years; this is hardly surprising given that at the outset magistrates punished offenders and raised taxes. They were under increasing criticism in the 18th century for being corrupt and tyrannical applying the law for their own benefit and taking bribes. They were accused of exercising their powers to block highways for their own ends. Allegations were made of direct corrupt practices in the metropolis. Sentences meted out were often inhumane and disproportionate by today’s standards. Many historians believe that accusations of abuse of power may have been overstated and criticism should be directed at the system in which they operated.

In the words of Sidney Smith:

“What in truth could we substitute for the unpaid magistracy? We have no doubt but that a set of rural judges, in the pay of the government, would very soon become corrupt jobbers and odious tyrants, as they often are on the Continent. But the magistrates, as they now exist, really constitute a bulwark of some value against the supreme power of the state.”

As the nineteenth century progressed, magistrates became overwhelmed by their ever extending responsibilities as both administrators and judges. Their role as local governors declined with the creation of District Councils in the 1880s. They retained some administrative functions (they continued to supervise liquor licensing into this century) but were largely left free to focus on criminal jurisdiction. From the mid eighteenth century stipendiary magistrates were appointed in London and in areas where the lay magistracy was regarded as deficient. By 1835 a statute allowed municipal corporations to ask the Home Secretary to appoint a stipendiary magistrate who had to be a barrister of not less than 7 years standing.

In 1946 Lord Justice Tucker investigated a case in which magistrates in Cardiganshire had acquitted their clerk of a prosecution brought by the Minister of Food. He concluded that the justices: “obviously needed some guidance as to what the real issues (were) to which they should address their minds”.

In the same year (1946) the government set up a Royal Commission to consider all aspects of the magistracy. The majority of members were adamant the system of lay justice should be retained, although a dissenting member, Lord Merthyr, concluded that it was “a question not of whether but when [lay justices] should be replaced by professionals”. Ironically, Lord Merthyr later became one of the strongest advocates for the lay magistracy serving as chairman of the Magistrates’ Association for many years.

The Royal Commission pointed out that it was preferable that a lay bench of two or more magistrates determined issues of fact than a single stipendiary magistrate sitting alone or even a High Court Judge sitting with a jury. The Commission did not propose abolition of stipendiary magistrates but that they should sit with lay justices. This proposal was not adopted.

Sir Thomas Skyrme, whose compendious History of the Justices of the Peace is one of the most comprehensive treatises on the subject, suggested that: “the JPs’ chances of avoiding extinction were greatly enhanced by the presence of a stipendiary system capable of relieving pressure on them without usurping their position.”

Sir Robin Auld was commissioned in 2000 to undertake a review of the criminal courts. He could see no reason from departing from the balance of lay magistrates and professional judges at that time. (In 2000 there were 96 District Judges as stipendiary magistrates are now called). He concluded:

“District Judges and magistrates both came well out of the researches of Morgan and Russell. There was not much to choose between them in such matters as attentiveness, clarity, courtesy and so on.” But they
concluded that District Judges had the edge in their control of proceedings in moving them on; in resisting delaying adjournments; so that the more the number of District Judges, the fewer court appearances. They also found that District Judges are more likely than magistrates to refuse bail; to issue arrest warrants for failure to attend court; and to impose immediate custodial sentences. Auld supported the continuance of both groups.

Magistrates’ and District Judges’ powers of sentencing are limited to six months imprisonment or 12 months for two or more serious offences. Defendants who require greater punishment are sent to the Crown Court which is a more expensive process. Extended powers of sentencing are on the statute book allowing magistrates and district judges to sentence to 12 months for a single offence, but that power is yet to be brought into force.

Attempts have been made to determine the relative value of professional and lay magistrates. In their research Morgan and Russell found it hard to calculate the respective costs but the difference is probably not significant. One would assume that a system relying on unpaid volunteers would be cheaper than one that relied on paid judges. Professionals, particularly those who sit alone and do not discuss decisions, can dispatch work quickly reducing need for accommodation and reducing the costs of those who appear before them. Magistrates need the support of a trained lawyer; a district judge can sit with an unqualified assistant. Magistrates are not paid for their services but they can reclaim their costs. The direct costs of the court process could be lower if only professionals sat: however the costs to the prison service may be greater with professional judges if the research mentioned by Sir Robin Auld is correct.

The tradition of lay input into the administration of justice is long established in this country. David Cameron’s “Big Society” is a further iteration of that long held belief that “volunteerism” is a public good to be encouraged. It is argued also that lay magistrates inspire greater public confidence than professional judges. Morgan and Russell found:

“Whereas the overwhelming majority of members of the public have heard of magistrates’ courts and the office of magistrate, almost three-quarters are unaware of the difference between lay and stipendiary magistrates”. Most cases begin and end in the magistrates’ court; the public is unaware that there is no jury in magistrates’ courts; most magistrates are not legally-qualified. This lack of public awareness varies according to experience gained from attending court, social status and education.

The Magistrates’ Association has done much work in the community in an attempt to raise awareness of their work and inspire public confidence in the courts. Magistrates are uniquely placed to inform the public of the work of the courts for, if the public believed the courts are letting them down, they might take justice into their own hands. Although successive governments have talked about the use of “community courts”, and more recently “neighbourhood resolution panels” to involve local communities in dealing with low level crime and anti-social behaviour, magistrates argue they are de facto “community courts”.

Currently the balance of professionals and lay magistrates in the courts is changing in favour of professionals. The workload of the courts has fallen substantially. A combination of measures to divert criminal work from the courts has had significant impact. The government has also expressed interest in finding other methods of dealing with those who are guilty of low level crime in the community without resort to the courts. Fixed penalties, originally introduced for motoring offences, are now available for offences of disorder and low value thefts. Cautions are regularly used for adult offenders. Neighbourhood resolution panels are to be piloted allowing offenders and their victims to be brought together with criminal justice professionals to agree what action should be taken to deal with an offender. If this form of restorative justice proves successful it is likely to further erode the work of the courts.

It is ironic that, because courts are closing, those remaining are becoming more remote and magistrates are less in touch with the communities they serve. The increase in police powers to punish offenders challenges the principle that prosecution and justices should be separated and that the judiciary should oversee the administration of justice.
The powers exercised by the police save money and time where offenders admit their guilt. There must be limits to what can be dealt with administratively but clearly the government believes those boundaries have yet been reached.

Magistrates could provide judicial oversight of the police exercise of administrative justice by a paper review of their decisions though this would be costly and time consuming. It is also uncertain how the errors found could be remedied.

Defendants can elect to be tried in the Crown Court by a jury but the cost of a straightforward sentencing case is estimated to be over 8 times greater than that of the magistrates’ court. The government discourages election for trial by reducing the availability of legal aid. If the work of magistrates is diminishing, their time might be harnessed in dealing with some of the work of the Crown Court.

While the need for magistrates in Criminal Law is reducing, there is a substantial and growing area of non-criminal work. Magistrates have long had responsibility for aspects of Family Law and in the Juvenile Courts. When the Children Act 1989 came into force, new Family Courts were set up and magistrates specially trained to deal with children and families were appointed.

My initial question was—Is there a future for the magistracy?

I believe so. Magistrates can administer justice efficiently and economically. Their contribution makes the administration of justice more democratic and ensures involvement of the laity. They are broadly representative of the communities they serve. They present a cost effective alternative to the Crown Court for the less serious cases.

The magistracy can respond to the changing needs of the judicial system. The financial pressures on public services should result in greater use of this valuable resource; however the speed at which cuts in resources are being made, means that planned reforms are not possible.

Magistrates are ordinary, fiercely independent people who know the locality in which they work. They have shown over the years that they can adapt to change and thrive. The long term future of the magistracy is uncertain but there is every likelihood that it will respond to the adversities it currently faces.

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PICASSO CERAMICS: 
THE ATTENBOROUGH COLLECTION

Dr Marilyn McCully
Picasso Specialist; Curator, Picasso Ceramics
Exhibition New Walk Museum

In partnership with New Walk Museum
Lecture delivered on 21st November 2011

The world-renowned artist Pablo Picasso was 65 years old, when in 1946 he and his young companion, the painter Françoise Gilot, left Paris where the artist had spent most of the war, for the south of France. The Mediterranean region held powerful associations for him and these are the reflected in the works that he would carry out there. “Every time I come to Antibes,” Picasso said, “it takes hold of me; it takes hold of me over and over again ... I cannot explain the call.” By turning to ceramics, an age-old art form, so evocative of this part of the ancient world, Picasso not only reinterpreted traditional forms and motifs in fired clay but he also transformed vases, plates and jugs into animals and figures, bullfights and the sea itself. Moreover, he made them Picassos – that is, works of art. This process of metamorphosis – turning one thing into another – is the domain of the ancient Gods, and, in a sense, Picasso now saw his own creative powers as God-like.

Gilot and Picasso were staying in the house of his printer Louis Fort in Golfe-Juan on the coast, not far from the ancient port of Antibes, known in Greek times as Antipolis, when in 1946 he was invited to work in the château Grimaldi (now the Musée Picasso, Antibes). There he did a series of paintings and drawings, many of which celebrate the sea and its mythological associations. Gilot has recalled that one day that summer, the photographer Michel Sima, who helped Picasso with all manner of tasks associated with the artist’s work at the château, introduced them to Georges and Suzanne Ramié, owners of a ceramics factory in nearby Vallauris. The Ramiés recognized that the artist’s name and presence at their premises would enhance the reputation of their business, which was based both on ‘art pottery’ and domestic ware, and they offered him the use of the ateliers and the collaboration of the craftsmen who worked there.

When Picasso visited the Ramiés for the first time, he was intrigued by the place itself: the workshop was situated in a handsome old building with a traditional wood-fired kiln in the courtyard. Above all, he was impressed with the abilities of the master potter Jules Agard, and he saw the possibility of a creative collaboration with him. He also welcomed the opportunity to work alongside Suzanne Ramié and her craftsmen in order to learn as much as he could about the secrets of ceramic art. However, it would be another year before he began his activity in earnest.

The town of Vallauris had been a major centre in Roman times for the production and exportation (from Golfe-Juan) of amphorae, which were filled with garum, a kind of fish-paste. These traditional vessels were made from the particularly fine, local pinkish-red clay, which had given the place its name: ‘valley of gold’. After a lapse of many centuries, the manufacture of ceramic cooking and domestic ware was revived in the eighteenth century, and the town flourished once again until metals began to replace traditional earthenware around 1920. Despite a period of recovery in the early 1940s because of the shortage of metal during wartime, the industry collapsed soon afterwards. However, the existence of ceramic production facilities in Vallauris encouraged a number of young craftsmen interested in art pottery, including Suzanne and Georges Ramié, to settle and work there. They took over an old pottery, which they called Madoura – the name derived from the first
letters of the word maison, Suzanne’s maiden name Douly, and Ramié.

In order to familiarize himself with techniques of ceramic decoration, Picasso started by working at Madoura on a large number of ordinary press-moulded plates, known as long plates (plats rectangulaires), which were in regular production at the factory. On one after another, he experimented with incising, impressing or adding relief to their surfaces before the clay had fully dried, while trying out different means of applying the slips, oxides and glazes that give colour to the pieces after they are fired. Suzanne Ramié first instructed him in the use of basic materials, and Gilot recalled that Picasso also consulted a chemist at one of the local perfume factories in Golfe Juan to learn more about the properties of enamels and oxides.

The clay used at Madoura was either red or pink (some of it local), or white, which was imported. All of the pottery produced at Madoura can be classified as earthenware – that is, clay fired at a relatively low temperature. Earthenware is characteristic of traditional domestic ware and vessels of the region, and, for this reason, the popular connotations of the material held a certain appeal for Picasso. When he chose colours and particular motifs to decorate borders, including spots and repeated, simple brushstrokes, he often referred to the decorative schemes of popular earthenware. The means he used were also traditional – engraving and gouging or adding clay (often the material that had been gouged out) to the surface to create relief; enhancing the surface with contrasting clays applied as slip (clay diluted with water); adding colour through the use of metallic oxides; and finishing the surface with opaque or transparent glaze.

Certain pots make specific reference to Greek vase painting with its predominantly red and black colouring. Fauns and bearded men representing the gods allude to the age of Antipolis in Picasso’s work as a whole at this time, and in ceramics they frequently populate the surfaces of plates and jugs. As if he were writing his own myths in his work, the artist often takes liberties with the traditional roles of mythological creatures. In Picasso’s world, fauns and centaurs mix with Françoise-like nymphs, dancing to the sounds of pipe-players in Bacchic celebrations. In other scenes, the half-man, half-horse centaur is transformed into a marvellous horned picador fighting a bull. Other ceramic traditions, including those of Provence, come into play, both in the forms that Suzanne Ramié created and Picasso decorated, and also in colour schemes, imagery and decoration.

The Attenborough collection of Picasso ceramics was formed by Richard and Sheila Attenborough and their children over some 30 years. What began as a first, casual visit to Madoura in the summer of 1954, became a regular event, when they spent time each year in their summer home not far from Vallauris in the south of France. Their first acquisitions were some of Picasso’s souvenir ashtrays and an important empreinte originale plate, a large Head of a goat, which has, since that time, always had pride of place in their home. Over the years, they added many types of Picasso editions, ranging from long plates, jugs and bowls to the large thrown vessels and Provençal-inspired pots that were originally produced by Suzanne Ramié and decorated with enormous ingenuity by Picasso. In addition to their purchases, the Attenborough children also began buying pieces for presents and other occasions to add to the collection. The majority of pieces in the collection are editions: that is, the individual pieces were produced in multiples by the Madoura craftsmen at the factory with Picasso’s permission.

Suzanne Ramié counted the Attenboroughs as some of her best clients and, on one notable occasion, without their knowledge, she reserved one of the sets of eight bullfight plates for them before they even turned up at Madoura. Once they saw the spectacular bullfight series, she pretended that she had none left to sell them. She then took them upstairs in the pottery, where they discovered a set packed and ready to send with the Attenborough name on the label. Later, her son Alain Ramié continued to be in touch with the Attenboroughs, and he sometimes brought recent work to them in London.

In the 1980s, the Attenboroughs also added several unique ceramics to the collection, beginning with their acquisition of Head of a Bullfighter, a long plate, and an extraordinary Head of a Woman jug, both of which came directly from the artist’s estate and were offered by Nicola Jacobs at her gallery in 1984. Lord
Attenborough, by that time recognized as a pre-eminent English collector of Picasso ceramics, contributed the introductory essay to the catalogue of that show. They later added another unique long plate, Head of a Woman, and a lively painted cache-pot with heads of a man, both of which were acquired at auction.

Over the years, the Attenboroughs were not only assiduous collectors but they had a good eye for quality and innovation in Picasso’s ceramics. Many of the pieces in the collection are empreintes originales, which by virtue of the empreinte process — making impressions from Picasso’s moulds — are close to the hand of the artist. Moreover, the fact that the collection grew each year, with his most recent experiments represented among the latest editions, the collection follows Picasso and the Ramiés’ enterprise as it developed over the same period of time. This close tie to Picasso’s own creativity in the medium of fired clay is, in part, what makes the Attenborough collection so remarkable. But this is a collection that will have a continued life, when the works are shown in their permanent gallery in Leicester. As a whole, the group of over 140 pieces represents for the visitor to the New Walk Museum & Art Gallery the opportunity for real discovery. Close study of each of these earthenware pots reveals a deep understanding on the artist’s part of the great traditions of ceramics, dating back to ancient times, and a fresh and vital world of experimentation, humour and personal references that all reflect the art of their creator Pablo Picasso.
In his groundbreaking book Micrographia, published in 1665, the great English physicist, astronomer, geologist, chemist, architect and microscopist Robert Hooke observed that fossils ‘do owe their formation and figuration, not to any kind of Plastick virtue inherent in the earth, but to the Shells of certain Shell-fishes which... came to be,... fill’d with some kind of Mudd or Clay or petrifying Water, or some other substance, which in tract of time has been settled together and hardned (sic) in those shelly moulds into those shaped substances we now find them.’ Like a few other free thinkers on continental Europe, such as Agostino Scilla, Hooke realised that fossils were the petrified remains of once living organisms. Although we take this for granted today, in 17th century Europe such thoughts were both radical and heretical. One particular type of fossil that strongly influenced Hooke’s views were fossils he had collected as a boy on the Isle of Wight, and which he called ‘button-stones’ and ‘helmet-stones’. We now know them, respectively, as regular sea urchins and heart urchins (Figure 1). Both types are frequently found fossilised in Cretaceous and Jurassic rocks in England, throughout much of Europe, the eastern Mediterranean region and North Africa.

Fossil sea urchins, especially one type from the chalk called *Micraster*, played a significant early role in supporting Darwin’s theory of evolution. Yet for thousands of years before this people had been collecting fossil urchins. The discovery of these particular fossils in many archaeological deposits provides firm evidence that people have been collecting them for literally hundreds of thousands of years (McNamara 2010). But why were they doing it? By examining the archaeological context in which fossil urchins are found, along with the folklore attached to them which has survived into recent times, it is possible to reconstruct some of the myths associated with these star-crossed stones.

**Fossil Urchins in Archaeology**

Archaeological evidence comes from two sources. One derives from fossil urchins that have been artificially altered in some way, or which occur on a rock which has been turned into a tool. The second source is from the archaeological association of the fossil – the context in which it was found and with what (McNamara 2007). One frequent such occurrence is the presence of fossil urchins with human burials. Evidence from many archaeological sites throughout much of Europe, the Near East and northern Africa indicates that fossil urchins attained the status of cult objects, imbued with powerful magical and spiritual significance, particularly during
the Neolithic and Bronze Age. These magical powers since then dwindled into the folklore that as recently as the last century, saw them regarded as either apotropaic objects, in other words, capable of warding off evil, or they just bestowed luck on their finders.

The earliest evidence for someone having collected a fossil sea urchin is an Acheulian hand axe found in Swanscombe, Kent and made about 400,000 years ago. Exposed on the hand axe is the base of the fossil urchin *Conulus*, preserved as a distinctive five-rayed star (Figure 2). The collector of this flint was probably a member of Homo heidelbergensis. Only one side of the axe was worked. Had the other been, much of the fossil is likely to have been destroyed. This suggests that the fossil was collected and made a prominent part of the hand axe because the five-rayed star pattern had an aesthetic appeal to its finder, a species of hominid other than our own. Other Early Palaeolithic similar flint axes with fossil urchins have been found in France.

Another hominid species that collected fossil urchins was Homo neanderthalensis. Some of their characteristic Mousterian style scrapers have been found in France made entirely from the fossil, while others were incorporated into the tool. This tradition continued in Homo sapiens. In recent years many Neolithic flint tools have been found in Belgium that incorporated fossil sea urchins (McNamara 2010). And it was during Neolithic times, after many societies had traded their nomadic hunter-gatherer existence for permanent settlements with domesticated animals and plants, that people began to bury their dead. And with them they quite often buried fossil sea urchins. In most cases just a single fossil was placed in a grave with a body. But sometimes very large quantities were placed in the burials. For instance, in one Bronze Age grave excavated near Dunstable (Smith 1894) a young woman and her child were buried with more than 300 fossil urchins (Figure 3). The most extreme example, though, was a Bronze Age site near Héricourt in France, where a tomb was found that contained a human skull, a cup made from a deer’s horn along with an estimated 2 to 3 cubic metres of fossil urchins. It has been calculated that this could represent more than 20,000 fossils. The great spiritual significance of these fossils in northern Europe during Neolithic times is also demonstrated by large barrows (burial mounds) in Brittany that when they were excavated were found to contain nothing but a single fossil sea urchin – not even a body.

**Fossil Urchins in Mythology and Folklore**

A link with Norse mythology is shown by the discovery of a fossil sea urchin along with a broken Neolithic stone axe in a pot in an Iron Age cremation deposit near Tunbridge Wells. This points to an association with the god Thor, because in both Danish and English folklore gathered in the early 20th century reveals that both fossil urchins and stone axes were called ‘thunderstones’ (McNamara 2007) and were believed to have been thrown to Earth by Thor. Because he was not only a thunder god, but also the peasants’ god who protected them, fossil urchins were placed near windows and doors both to ward off lightning strikes, as well as protecting the building from evil.

Other folk names given to fossil sea urchins in England include ‘shepherd’s crowns’ and ‘fairy loaves’. Both names were probably derived from Celtic or pre-Celtic terms and beliefs in the association of these object with the afterlife. The frequent occurrence of fossil urchins in burial mounds (which were probably sites considered to be passages from this life to the next), suggests that these fossils were thought to ensure rebirth of their bearer. By Christian times such spiritual beliefs had degenerated into folk traditions of protecting the house from evil and keeping the milk fresh. ‘Fairy loaves’ (the fossil urchin *Echinocorys*) were thought to help ensuring that the bread would rise as well. They were also just thought of as objects that simply brought good luck.

**Fossil Urchins in Mediterranean Archaeological Sites**

Fossil urchins were also significant objects in the Mediterranean region from at least as far back as Neolithic times. However, rather than being associated with burials, as in northern Europe, they had a more practical use. Many had holes drilled through them so they could be used as spindle whorls. The use of objects with the five-rayed star pattern suggests they may also have been used because they had some degree of spiritual
significance. One drilled fossil from one of the earliest Neolithic settlements in the eastern Mediterranean, ‘Ain Ghazal in Jordan, could have been used as a fertility object, due to the positioning of the hole (see Figure 4). Other fossil urchins from Neolithic and Iron Age sites in Jordan have been altered to enhance the five-rayed star pattern. It has been suggested (McNamara 2010) that this pattern could have been regarded as being representative of the human form, similar, in Renaissance times, to Leonardo da Vinci’s Vitruvian Man.

Undoubted indication of the use of a fossil sea urchin by people in ancient Egypt is a spectacular fossil urchin found at Heliopolis in Egypt. What makes this specimen so special is that hieroglyphs were inscribed on this fossil about 3500 years ago that tell us the name of the priest who found it, one Tja-nefer, and where he found it – in the quarry of Sopdu, a god sometimes known as the ‘Morning Star’. The presence of the distinctive five-rayed star on this fossil, and the extensive use of this symbol by ancient Egyptians in their burial chambers to symbolize the stars in the sky to which the spirit of the pharaoh returned, suggests that these fossils might have played an important role in Egyptian funeral rites.

Five-pointed Stars

The apotropaic powers that fossil sea urchins are thought to have possessed shows a close parallel with the same attributes of the pattern of the five-pointed star. The earliest record of the use of this symbol is nearly 5,000 years ago in Mesopotamia. In medieval times it was commonly placed above doors of houses or stables, or on cots, to keep the devil at bay. In the medieval poem ‘Sir Gawain and the Green Knight’, Sir Gawain is described as having a five-pointed star on his shield because it symbolised chivalry, courtesy, piety and kindness.

Perhaps the fossil sea urchins placed around windows on a medieval church in Hampshire were also thought to protect the building from the devil (McNamara 2010). Given the very long fascination that humans have had with fossil sea urchins, for hundreds of thousands of years, I think it is not unreasonable to suggest that the five-pointed star had its origins in the long fascination people have had with these star-crossed stones.
USE AND DETECTION OF PERFORMANCE ENHANCING DRUGS IN RELATION TO THE 2012 OLYMPICS

Professor Trevor Brown
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Lecture Delivered on 9th January 2012 sponsored by the Royal Society of Chemistry

In March 2011 the Minister for Sport and the Olympics, Hugh Robinson, said he viewed doping as the most serious threat to the integrity of London 2012

Structure of Lecture

- Brief case studies of doping athletes and the pharmacology of the substances they abuse.
- The global response to doping - creation of WADA (World Anti-Doping Agency).
- Detection of drugs.
- London 2012 – the threats and strategies.
- The BOA (British Olympic Association) / WADA disagreement.
- An alternative philosophy to control doping.
- Reference and recommended reading

Case Studies

Ben Johnson of Canada won the men’s 100m final at the Seoul Olympics in 1988 in a World Record time. It was a sensational race.

Subsequently Johnson tested positive for the anabolic androgenic steroid stanazolol, was stripped of his gold medal and banned for two years.

This occurrence shocked the World; the integrity of the Olympic Games was under threat from the use of performance enhancing drugs (doping).

In 2003 the European 100m champion Dwain Chambers, tested positive for the ‘designer steroid tetrahydrogestrinone (often referred to as THG or The Clear). He was banned for two years.

In the 2000 Sydney Olympic Games Marion Jones became the first woman to win five gold medals in track and field at a single games. In 2007, after years of denial and a clean testing record, she finally admitted using performance enhancing drugs including THG. She lost her medals and her name was removed from the Olympic records.

BALCO labs (Bay Area Laboratory Co-operative) in Los Angeles had synthesised THG, an untested, unapproved and potent drug that was not monitored because its availability was unknown. In fact its BALCO code name was ‘The Clear’ because it did not provoke a positive test. It was only identified when a sample in a syringe was sent by an informant to WADA who characterised the molecule and placed it on the steroid data base.

Through the 1960s -1980s, many East German female athletes unknowingly underwent systematic, government sanctioned doping with anabolic androgenic steroids. Some have subsequently been compelled to change their sex because of the large quantities of AAS they had been given. They were awarded millions of dollars in compensation in 2002 for the terrible side-effects that they had experienced.
Historically anabolic androgenic steroids (AAS) have been the most popular group of doping agents and are still widely used today. They turn on cells to produce protein, leading to the development and repair of muscle tissue, especially when dosed in conjunction with appropriate training.

**However the side-effects of abuse are horrendous:**

**Liver**
- blood filled cysts
- jaundice (yellowish pigmentation of skin, tissues, and body fluids due to blockage of bile flow), caused primarily by orally active drugs.

**Cardiovascular system**
- high blood pressure
- stroke
- enlarged heart
- decreased high density lipoproteins - ‘good’ cholesterol
- increased low density lipoproteins - ‘bad’ cholesterol

**Hormonal changes in Men**
- Acne
- Reduced levels of testosterone, libido, testicular size and sperm count, some times leading to impotence.
- Enlargement of prostate gland and breasts.

**Hormonal changes in Women**
- Acne.
- Development of male features including deepening of the voice, baldness and growth of facial hair.
- Enlarged clitoris, loss of fertility and birth defects.

**Psychological behaviour**
- Increased aggressiveness and possible violent behaviour (‘roid rage’).

**Tommy Simpson** was the most successful English road racing cyclist of the post-war years. He was voted the 1966 BBC Sports Personality of the year.

He died on Mont Ventoux of total exhaustion and heat stroke during the 1967 Tour de France after consuming amphetamines and alcohol.

The use of stimulants can drive the body through the barrier to total exhaustion. In addition amphetamines cause skin blood capillaries to contract, reducing the body’s ability to cool itself and increasing the potential for heat stroke.

**David Millar** was a highly promising Scottish cyclist who received a two-year suspension for confessing to using the banned blood-boosting drug **erythropoietin (EPO)** in 2001. He has since written a highly acclaimed book ‘Racing through the Dark’ (2011) - a critical analysis of his experiences in professional cycling.

EPO is a natural protein hormone that stimulates red blood cell production. It is produced naturally in response to anaemia, haemorrhage, pregnancy, or living at altitude. Pharmaceutical (recombinant) EPO has been developed to treat conditions such as anaemia. Enhanced red blood cell production leads to better oxygen supply to tissues that improves stamina and endurance and so is attractive to long distance cyclists and cross-country skiers. However increased blood viscosity leads to a greater risk of thrombosis and heart attack.

The Scottish skier **Alain Baxter** ‘won’ a bronze medal at the 2002 Winter Olympics in Salt Lake City. He later tested positive for methamphetamine and the medal was withdrawn. He had been using a Vicks Inhaler bought over the counter in Utah to relieve a cold. He was aware that the British Vicks Inhaler was permitted in sport and assumed the American version had the same contents. Strict liability meant he had no defence.

Athletes use supplements to enhance the quality of their diet within their busy life-style and to aid recovery from injury and ill-health. Supplements may contain unidentified substances from the WADA prohibited list. Athletes may be mislead by inaccurate labelling or because the product was contaminated during production. Under strict liability rules an adverse test result will lead to sanctions even though the athlete had no knowledge that the substance was being taken.
The World Anti-Doping Code

This is a set of anti-doping rules, devised by WADA in 2003 and annually updated, that harmonises testing laboratories, therapeutic use exemptions (TUEs) and the List of Prohibited Substances and Methods.

Under the principle of strict liability athletes have to take personal responsibility for everything that goes into their bodies. The list identifies substances (e.g. performance enhancing drugs) and methods (e.g. blood transfusions) that are prohibited both in competition and out of competition. A substance or method will be included if it meets two or more of the following criteria:

- it has the potential to enhance sports performance
- it represents a potential health risk to the athlete
- its use violates the ‘spirit of sport’.

‘The spirit of sport is the celebration of the human spirit, body, and mind, and is characterised by the following values’:

- ethics, fair play and honesty
- maintenance of health
- excellence in performance
- enhancing character and education
- fun and joy
- teamwork
- dedication and commitment
- respect for rules and laws
- respect for self and other participants
- courage
- community and solidarity.

The Prohibited List includes:

**Substances:**

- Stimulants
- Anabolic agents.
- Peptide hormones (e.g. EPO, hGH) and growth factors (e.g. IGF-1).
- Beta-2 agonists.
- Diuretics.

**Methods**

- Chemical and physical manipulation, e.g. blood transfusions.
- Gene doping.

**Testing:**

The selection of athletes for testing may take place:

- in competition: by random selection, based on finishing position, or for a specific reason
- out of competition: anytime, anywhere without advanced notice - future whereabouts information is required.

**Procedure:**

- the athlete is met by Doping Control Officer (DCO) who explains athlete’s rights and responsibilities
- the athlete is required to sign the appropriate form and then report to the Doping Control Station with the DCO in attendance
- the identity of athlete must be established
- urine and sometimes blood samples will be required
- the DCO observes the passing of the urine sample
- the athlete divides the urine sample into A and B and signs the form
- samples are sent to a WADA accredited laboratory
- sample A is opened and analysed
- sample B is securely stored
- if sample A is positive, sample B is analysed to confirm the result.

The Irish swimmer Michelle Smith ‘won’ three gold medals in the 1996 Olympics, but her whiskey-spiked urine sample indicated an attempt to mask the presence of drugs (including anabolic steroids). Smith was suspended for 4 years for tampering with her urine sample.
WADA Therapeutic Exemptions provide authorisation to take a Prohibited Substance, to maintain normal health, under well-defined and restricted conditions; providing there is:

- a significant impairment to health
- no additional enhancement of performance
- no therapeutic alternative.

Detection of Drugs

‘Small’ molecules like amphetamines and anabolic steroids are normally detected using chromatography (a separation technique) followed by mass spectrometry (to characterise the separated molecules).

‘Large’ biological molecules like EPO and hGH (human Growth Hormone) require much more sophisticated techniques that are challenging and expensive.

Chromatography methods include gas chromatography for more volatile molecules and high performance liquid chromatography for less volatile molecules or where there is some other advantage.

Mass spectrometry is a technique whereby a molecule is fragmented under carefully controlled conditions. The individual fragment masses are used as a fingerprint to compare against a data base of mass spectra of known compounds in order to identify the molecule under test.

The detection of exogenous EPO in the presence of endogenous EPO utilises the fact that different forms of EPO can be characterised by their ‘isoform’ distribution. Isoforms contain the same protein, but vary in their total negative charge depending on the number of bonded acidic carbohydrates. These isoforms can be separated on a gel plate with a pH gradient. This allows direct comparison of pharmaceutical EPO with a test sample from an athlete.

London 2012 – the threats and strategies

In March 2011 the Minister for Sport and the Olympics, Hugh Robinson, said he viewed doping as the most serious threat to the integrity of London 2012.

LOCOG (London Organising Committee of the Olympic Games and Paralympic Games) aims “to ensure the integrity of sport, the health of athletes and fair competition”.

GlaxoSmithKlein (GSK) has formed a partnership with Kings College, London (KCL) to provide facilities and equipment to operate a WADA accredited testing laboratory at Harlow. Thousand of samples will be analysed 24 hours a day. GSK have also agreed with WADA to supply confidential information about medicines in early stage development which could be abused by athletes.

There are plans to undertake the highest number of blood and urine tests than ever before:

- 5000 tests at the Olympics
- 1200 tests at the Paralympics
- reaching a peak of 400 tests in one day.

This relies on recruiting sufficient Doping Control Officers who are volunteers.

There will be a ‘no needle’ policy that bars athletes possessing syringes and other medical equipment that could be used for doping.

Professor David Cowan (KCL Olympics Testing Lab.) has said that a new test for human growth hormone will be deployed in 2012. He is also hopeful of a test for autologous blood transfusions, which would involve aging blood samples by studying the mitochondrial RNA.

The British Olympic Association / WADA Disagreement

The IOC / WADA ‘Rule 45’ bars athletes who receive doping suspensions of more than 6 months from the next Olympic Games. Recently the U.S. Olympic Committee challenged the rule at the Court of Arbitration for Sport (CAS) based in Switzerland on the basis that athletes were being punished twice - double jeopardy. The Court decided, in October 2011, that, if athletes have completed their suspensions, they cannot be then barred from the Olympics.
The BOA has a bylaw that it introduced in 1992 that bans any athlete convicted of a ‘serious’ doping offence from the Olympics for life. Britain is the only country to impose a life-time ban. WADA have advised that in light of the CAS judgement this bylaw is illegal.

However BOA are appealing the judgement, saying that it would lead to a “toothless gesture towards zero tolerance”. Lord Coe has supported BOA’s stance. If the appeal is not successful BOA will be at risk of being declared non-compliant with the WADA code.

An Alternative Philosophy to Control Doping.

Professor Julian Savulescu (University of Oxford) is a leading proponent for a change of emphasis in the existing code.

He recognises that:

“In every professional sport where doping could confer an advantage, there is doping”

He identifies problems and suggests alternatives.

One problem is strict liability. This may make victims of athletes who are competing in good faith, but have unknowingly ingested small amounts of banned substances, e.g. Alain Baxter, who accidentally inhaled a small amount of methamphetamine when he used the American version of a Vicks decongestant inhaler.

Currently athletes may profit from doping because most are relatively unlikely to ever undergo testing. David Howman, Chief Executive of WADA, estimates that currently only 50% of doping athletes are caught (August 2011).

Drugs such as erythropoietin (EPO), human growth hormone (hGH) and testosterone are natural chemicals in the body and this makes doping more difficult and more expensive to detect. In the future there may be many undetectable drugs - even the potential for gene doping.

Professor Savulescu proposes an alternative procedure based on placing the ‘Athlete’s Health First’. So instead of testing for EPO the blood viscosity is checked to ensure it is at a safe level. Anyone above that level, whether through the use of drugs, training, or natural mutation, should be prevented from participating on safety grounds. What matters is a safe concentration of hormone, not whether it is natural or artificial.

There is another argument for this policy based on fairness: provided that a drug is safe, it is unfair to the honest athletes that they have to miss an advantage that the drug-takers enjoy.

Professor Savulescu recommends that there should be more rigorous and regular evaluation of an athlete’s health and fitness to perform in events. Also that drugs should be administered by a qualified person and would be of therapeutic quality. Drugs currently bought by athlete’s over the internet or on the street are often at best impure and at worse a completely different and potentially dangerous substances. If athletes are excluded only on the basis of whether they are healthy enough to compete, the question of responsibility and liability becomes irrelevant.
THE VALUE OF THE HUMANITIES

Professor Dominic Shellard
Vice Chancellor, De Montfort University

Sponsored by De Montfort University
Lecture delivered on 6th February 2012

Introduction

Professor Shellard stated that his firm belief was that art and the humanities are far reaching and their impact has no cultural or topical boundaries. He quoted Albert Enstein who said: “All religions, arts and sciences are branches of the same tree”.

The Humanities permeate every aspect of his professional life and he described a holographic table that is in his office above which butterflies appear to hover.

The table was conceived and designed by the Holographic Research Centre which carries out innovative research into the investigation and development of Optical Security Devices and has just been awarded a UK Patent for its technology.

Constantly looking for ways to make De Montfort University (DMU) distinctive in key international markets, e.g. China and Japan, he referred to Great!, an international celebration of British arts and culture. (GREAT! Is Gang Resistance Education And Training (G.R.E.A.T.) is a gang and violence prevention program built around school-based, law enforcement officer-instructed classroom curricula. The program is intended as an immunization against delinquency, youth violence, and gang membership for children in the years immediately before the prime ages for introduction into gangs and delinquent behaviour- Ed.) It is a key initiative for 2012 before the Olympics and is being delivered in partnership with the British Library and HP (Hewlett-Packard Storage Vision).

A delegation from DMU visited Tokyo from the 23-25 April 2012 to coincide with William Shakespeare’s birthday. A celebrate of his work will include a display of the British Council’s copy of the First Folio, a joint lecture by British Ambassador David Warren and Professor Shellard and a symposium between UK Department of Business, Innovation and Skills (BIS) and the Japanese ministry of education focusing on higher education in England and Japan.

Humanities and Leadership

Professor Shellard believes that poems influence leadership which is a key issue for the HE sector (the 130 institutions which make up the higher education and research communities within the UK). He cited The General by Siegfried Sassoon as a model of leadership to be avoided:

“Good-morning; good-morning!” the General said
When we passed him last week on our way to the line.
Now the soldiers he smiled at are most of ’em dead,
And we’re cursing his staff for incompetent swine.
‘He’s a cheery old card,’ grunted Johnny to Jack
As they slogged up to Arras with rifle and pack.

* * *

But he murdered them both by his plan of attack.

Sassoon was recovering at Craiglockhart War Hospital in 1917 when he met Wilfred Owen who offers an alternative, more suitable model of leadership in his poem Anthem for Doomed Youth:

What passing-bells for these who die as cattle?
Only the monstrous anger of the guns.
Only the stuttering rifles’ rapid rattle

The General
Can patter out their hasty orisons.  
No mockeries now for them; no prayers nor bells,  
Nor any voice of mourning save the choirs,  
The shrill, demented choirs of wailing shells;  
And bugles calling for them from sad shires.

What candles may be held to speed them all?  
Not in the hands of boys, but in their eyes  
Shall shine the holy glimmers of goodbyes.
The pallor of girls’ brows shall be their pall;  
Their flowers the tenderness of patient minds,  
And each slow dusk a drawing down of blinds.

Owen had an inspirational concept of leadership in challenging times:

a) everybody has the potential to lead and make an impact: c 26,000 DMU staff and students who can make an impact

b) in tough times, don’t wallow, be pro-active: this poem was an active challenge (‘the poetry is in the pity’ Owen—Preface to his poems, “My Subject is War—-).

c) you can change things, we are never impotent: he wrote poetry on a devastated battlefield, we – in a turbulent world for universities – will defy unsupportive policies to create one of the finest universities in the country here at DMU.

Theatre Archive Project

Professor Shellard is working at the British Library on a major project to review an archive of a unique oral history of British theatre from 1945 to1968 which contains over 100 transcripts, images and sound extracts including descriptions of key post-war figures, e.g. John Gielgud, Ralph Richardson, Michel Saint-Denis and Cedric Hardwicke. The review will look at the history from the perspective of both the theatregoer and the practitioner.

Humanities as a public good

He drew attention to the growing outcry against threats to cut the funding of humanities at UK universities (The Observer, 28 Feb 2010) sparked by the credit crunch which Professor Colin Riordan (Vice Chancellor, University of Essex) described as “...a colossal failure of integrity.” The importance of the study of the humanities to the economy has also been noted in a group letter from Professor Geoffrey Crossick (Vice Chancellor, University of London) et al:

“Subjects such as literature, philosophy and history teach students to look at the world from a different perspective, to challenge ideas and to communicate effectively, to bring the flexibility and imagination that employers need and welcome.”

This point was illustrated by a number of case studies.

Case Study 1 That Full Complement of Riches: the contribution of the arts, humanities and social sciences to the nation’s wealth British Academy (2004)

The above research report outlined five key contributions of the humanities to the nation’s wealth:

- Contributing to cultural and intellectual enrichment
- Contributing to economic prosperity and well-being
- Contributing new knowledge and understanding of major challenges facing both the UK and the world
- Contributing to public policy and debate
- Providing a rigorous, beneficial and fulfilling education

The research report concluded that the humanities:

- give career benefits to individuals broadly comparable to those from other (often more expensive) subjects
- assist the formation of critical minds to bear on a wide range of crucial issues, resulting in a flourishing public culture, committed to respect for knowledge and intelligent debate
- encourage values and skills which sustain participatory democracy and responsible government.
Case Study 2

**Leading the World**: The economic impact of UK arts and humanities research UK. AHRC (UK Arts and Humanities Research Council) (2009)

The report asked three critical questions:
- Why is arts and humanities research important?
- Why should the taxpayer pay for arts and humanities research?
- Why fund arts and humanities research through the AHRC?

The report concluded that:

“In order to increase innovative capacity...the UK must exploit knowledge from the entire spectrum of an integrated research base. Increasing consistent expectations within the community will lead to an even greater role for the arts and humanities and subsequent growth of British economy”.

Case Study 3


- Challenged the Government’s value of the arts/culture in serving an instrumental economic role.
- This was challenged by David Edgar; as well as instrumental and patrician view of arts, humanities are there to challenge and provoke, not merely to serve.
- Provocative value to humanities, especially at this time of turbulence (not unlike when Arnold was writing about ‘sweetness and light’ in Culture & Anarchy).

**Editorial Note**: *Culture and Anarchy* is a series of periodical essays by , first published in Cornhill Magazine 1867-68 According to his view advanced in the book, “Culture [...] is a study of perfection”. He further wrote that: “[Culture] seeks to…… to make all men live in an atmosphere of sweetness and light [...].”

Case study 4

Focused on the Games and Animation component of the creative industries (Stephen Brown), at which DMU excels.

**Editorial Note**: Stephen Brown is Professor of Learning Technologies and Head of Department of Imaging and Communication Design at De Montfort University, where he directs Knowledge Media Design research, co-ordinates the Photographic Studies and Creative Imaging Research Cluster and is a member of the Photographic History Research Centre and the Centre for Adaptations

**Background**

De Montfort University has particular strengths in game art design, creative writing, game programming and research in game related topics such as artificial intelligence and gaze recognition.

The BA (Hons) Game Art course is the most popular in the UK and the only one in England with Skillset accreditation. Compared with the sector average of 12% graduate employment rates, 100% of De Montfort Game Art graduates found a job in the Video Games sector within six months (2008). The course has strong industry links offering internships at BMW and Ubisoft.

**Economic importance of the creative industries**

- “No one doubts the economic importance of the creative industries to the UK. At 6.2% of the economy, and growing at twice the rate of other sectors, they are proportionately the largest of any in the world.”
- The most innovative creative sector is Software, Computer Games and Electronic Publishing.
- The UK game development industry is a significant contributor to the UK GDP, contributing £1 billion in 2008. The industry itself is global, projected to grow at an annual rate of 10.6% to reach $86.7 billion in 2014.
- It is a destination for highly skilled creative graduates, employing 10,000 people in the UK.
DMU’s vision

DMU is establishing a university-industry collaboration centred on the East Midlands with the aim of stimulating and supporting the growth of the Games and related industries in this region.

It will achieve this by formalising and developing the GAME Alliance into a nationally recognised regional Knowledge Hub.

The GAME Alliance will catalyse the latent cluster of Games innovation and design capability in the East Midlands and connect it with sources of innovation elsewhere.

Within the GAME Alliance the role of DMU will be to act as a facilitator between otherwise competing companies to help build the trust needed to collaborate, to provide opportunities for professionals from different companies to come together to upgrade their skills, to share its research base and create funded opportunities for collaborative research.

Industry partners will provide student internship, placement and staff exchange opportunities. Partners will pool resources to promote the industry to schools and lobby educational policy makers to ensure that the skills requirements of the industry are properly reflected in the National Curriculum and the register of Strategically Importance

‘MEMORABILIA’: ROBERT BROWNING AND LITERARY CELEBRITY

Dr Joseph Phelan
Reader in Nineteeth Century Literature Department of English, De Montfort University

Lecture delivered on 5th March 2012

This year marks the two-hundredth anniversary not only of Charles Dickens, but also of one of his great contemporaries, the poet Robert Browning, who was born on the 7th of May 1812. Browning and Dickens knew one another, especially during Browning’s early career as a (largely unsuccessful) playwright, though they were never particularly close; and it is possible to detect a lingering resentment towards Dickens in the epigram Browning composed shortly after Dickens’s death in 1870. The revelations about Dickens’s childhood experiences in the blacking factory contained in John Forster’s Life of Charles Dickens came as a surprise to Browning, as they did to many others; and his response was to compose the following lines in a letter to his friend Emilia Pattison:

In Dickens, sure, philosophy was lacking,
Since of calamities he counts the crowning
That, young, he had too much to do with

Blacking:
Old, he had not enough to do with

Yours ever truly

RB

The missing word needed to complete the rhyme is, of course, ‘Browning’. Although he wasn’t always this bitter about the fame of others – and he did, as we shall see, enjoy his own share of a rather peculiar fame towards the end of his life – Browning was, all the way through his life, interested in the question of literary and artistic celebrity. Many of his poems deal with this topic, and he made repeated and strenuous efforts to separate the public perception of Robert Browning the man from the public’s interest in Robert Browning’s poetry. The posthumous revelations about Dickens were a warning about the fate of writers who courted celebrity; and Browning was
determined to make sure that his own private life would remain hidden from the prying eyes of the public.

The poem mentioned in the title of this paper, ‘Memorabilia’, was first published in 1855 as part of a volume called Men and Women:

1
Ah, did you once see Shelley plain,
And did he stop and speak to you?
And did you speak to him again?
How strange it seems, and new!

2
But you were living before that,
And you are living after,
And the memory I started at—
My starting moves your laughter!

3
I crossed a moor with a name of its own
And a use in the world no doubt,
Yet a hand’s-breath of it shines alone
‘Mid the blank miles round about—

4
For there I picked up on the heather
And there I put inside my breast
A moulted feather, an eagle-feather—
Well, I forget the rest.

This is typical of many of Browning’s poems in that, when you first read it, you might think there’s a bit missing. The poem has a distinctly enigmatic quality. We do not know who is speaking; we don’t know who is being addressed; and we are left to puzzle out the relation between the first two stanzas, with their discussion of Shelley, and the incident of the ‘moulted feather’ in the last two. The poem also ends on what musicians would call an interrupted cadence – what is ‘the rest’ that the speaker has forgotten? We are simply not told.

In placing the emphasis on the reader to do some of the work, ‘Memorabilia’ is typical of Browning’s poetry in general. He is a demanding writer. He wants his readers to be ‘co-creators’ with him, to be actively and imaginatively engaged with the poetry, not passive consumers of it. Sometimes, this led him to make demands on his readers that they were just not equal to. By the time he wrote ‘Memorabilia’, though, he thought he had found a form of poetry which could involve the reader without making excessive demands on him or her. ‘Memorabilia’ is an example of a ‘dramatic lyric’, a type of poetry which presents us with a speaker, and a dramatic situation, and (usually) a fictionalised listener within the poem. This form of poetry has been identified as Browning’s distinctive and permanent contribution to the grammar of English poetry (and indeed of poetry in general), usually under the name ‘dramatic monologue’. But Browning’s own term, ‘dramatic lyric’, is a useful one too. ‘Dramatic monologue’ implies a particular type of poem, closely related to stage drama in its idiom and methods; ‘dramatic lyric’, in contrast, is a larger and more inclusive category, dealing not only with poems that read like speeches from a play, but also with poems like ‘Memorabilia’, in which the dramatic framework is much more lightly sketched.

Although the speaker and listener of ‘Memorabilia’ are not precisely identified, the situation is clear enough; and the relation between the two parts of the poem is evidently one of analogy, with the speaker trying to express his feeling that the everyday world has suddenly and momentarily crossed paths with a distant and altogether more glorious reality. Shelley is invoked in ‘Memorabilia’ as the type of the poet who attracts this kind of adulation. Shelley was a figure of enormous significance to Browning during his formative years; but Shelley also came to represent a type of poetry – intensely personal, and intensely confessional – that Browning came to mistrust and reject, not least because it encouraged and even obliged its readers to take an interest in the life of the poet. This is clear in the essay that Browning wrote in 1852 to introduce a volume of Shelley’s letters, in which he contrasts ‘objective’ or dramatic poets with ‘subjective’ or personal ones. Poets of the former kind are resolutely impersonal, aiming at the creation of dramatic characters rather than the revelation of private feelings. For this reason, their work can be and is appreciated without a knowledge of their lives. Shelley, in contrast, is the epitome of the subjective poet, whose work is an emanation of his life; and, for poets of this kind, a knowledge of the life is not just desirable, but essential: ‘in our approach to the poetry, we necessarily approach the personality of
the poet...as readers of his poetry [we] must be
readers of his biography as well'.

In writing ‘Memorabilia’ Browning was, then,
reflecting on and responding to the growing public
appetite for information about the lives of literary
celebrities; and this is also apparent in the title of
the poem. Before the nineteenth century, the term
‘Memorabilia’ referred primarily not to physical
artefacts, but to collections of the sayings of famous
people. The first use of the term in its modern sense
is from the very same year as the publication of
Browning’s poem of this name – 1855 – and it is,
interestingly, identified in the OED as an American
rather than a British usage (Browning, at this point in
his life, had a large number of American friends).

The primary meaning of the title in the poem is, in fact,
the traditional one, but the metaphor used in the
second part of the poem establishes an equivalence
between this kind of ‘memorabilia’ and the treasured
physical objects which we think of when we hear the
word. The poem is, in fact, almost an object lesson in
the transfer of meaning from the former sense to the
latter – an indication of that remarkable sensitivity to
the shifting meanings of words which is one of the
distinguishing features of the greatest writers.

Given his suspicion of this kind of fame, it is easy to
imagine how Browning responded when, relatively
late in his life, people started treating him as a kind
of prophet or guide. Browning liked to exaggerate his
own early unpopularity, but there is no doubt that,
from the 1860s onwards, he achieved a new and
more substantial level of fame, one manifestation of
which was the opening of a number of ‘Browning
Societies’ around the English speaking world. The
first of these societies, gatherings of earnest men and
women who got together to discuss Browning’s
poetry and work out its meaning, was formed in
London in 1881.

Browning’s attitude towards this sudden and in many
respects unwelcome public interest in Browning the
man – as opposed to Browning the poet – is summed
up in the 1876 poem ‘House’, which begins:

Shall I sonnet sing you about myself?
Do I live in a house you would like to see?
Is it scant of gear, has it store of pelf?
“Unlock my heart with a sonnet-key?”

The fourth line is a more or less direct quotation from
Wordsworth’s poem, ‘Scorn not the sonnet’, in which
he describes the sonnet as the ‘key’ with which
‘Shakespeare unlocked his heart’. The comparison
with Shakespeare, the archetype of the dramatic
poet, is a revealing one. It suggests that the distinction
Browning was trying to make between poets who
invited the public in, and poets who deliberately
excluded the public, was not being respected by this
public, which claimed the right to snoop around
irrespective of the wishes of the poet.

Browning was, for the most part, true to his word in
this respect. He resolutely refused to cooperate with
biographers of his wife Elizabeth, only intervening
when erroneous information was published in
newspapers or unauthorised lives. He also took steps
to ensure that his own private life would be safe from
the prying eyes of investigators following his death,
burning a huge number of personal letters that would
have been of immense interest to future scholars and
critics. The only exception he made to his general
rule about intrusions into his private life was, oddly,
the courtship correspondence between himself and
Elizabeth, which he handed over to his son, in the full
knowledge that it would eventually be published. He
might, ironically, have done this in order to
counteract the effect of his wife’s indiscreet use of
the sonnet form in her 1850 Sonnets from the Portuguese
to chronicle the development of their relationship.

By the time of his death in December 1889,
Browning had become a genuine literary celebrity.
He was buried in Poets’ Corner, and his funeral was
a significant public event. This fame has not,
however, endured. The public commemoration of his
two-hundredth anniversary this year could charitably
be described as ‘muted’. He has, for the most part,
resisted assimilation to the heritage industry; he has
not, like Dickens, become a cultural icon. Given the
suspicions voiced in his poetry about what happens
when people are turned into two-dimensional images
of themselves, he would probably have been
relatively pleased about this. The ‘heritage’ approach
to literature can sometimes end up taking the place of
direct engagement with the literature itself; and
Browning’s poetry insists, above all, on the need for
the reader to play his or her part in the active creation
of the world of the poem.
How did this come about? Jennifer Owen graduated in zoology from Oxford in 1958 and subsequently gained a PhD at the University of Michigan. In 1962 she moved to the University College of Makerere (now Makerere University), Uganda, and then to Fourah Bay College (shortly to become the University of Sierra Leone). It was in Sierra Leone that she first noticed that there seemed to be more wildlife in her garden than in the neighbouring forest. This prompted her, when she returned to the UK taking a post at Leicester University in 1971, to wonder exactly what lived in her garden, and to begin a study that was to occupy the next 30 years.

Jennifer brought to this endeavour a unique combination of traits: a thorough academic training in zoology; a passion for both natural history and gardening; and an almost superhuman staying power. Few enough of us would contemplate trying to assemble a complete inventory of the beetles, birds, butterflies (and a great deal else) in our gardens for even one year; to persist for 30 years is an achievement that will probably never be equalled. Even more important was a recognition, long before ‘wildlife gardening’ was fashionable and fourteen years before Chris Baines first ever wildlife garden at Chelsea, (Professor Baines built the first wildlife garden ever allowed at Chelsea Flower Showin 1985-Ed) that gardens were an important but completely unrecognised habitat of our native wildlife, and that they did not depend upon creating bits of ‘fake countryside’. Owen’s own Leicester garden was, and remains, a neat, productive suburban garden of only modest size, devoted to growing flowers and vegetables. Her only concessions to traditional ‘wildlife gardening’ were to avoid pesticides and excessive tidiness. She kept pruning and clearing to a minimum and delayed it until winter if possible; she grew a wide range of herbaceous plants, trees and shrubs keeping every square inch covered with plants.

Over the whole 30-yr period, Owen recorded 2673 species: 474 plants, 1997 insects, 138 other invertebrates (e.g. spiders, woodlice, slugs) and 64 vertebrates (54 of them birds). In some groups, such as harvestmen, butterflies, moths, hoverflies, bees and ladybirds, this represents a quarter or more of the total number known from the whole of Britain. But this is only the tip of the iceberg, because no attempt was made to identify or count many large groups of insects. If we make some reasonable assumptions about these ‘missing’ species, probably well over 8000 species of insects alone visited Owen’s garden at one time or another.

For three years only, Owen made a detailed study of one large family of parasitic wasps, and found 533 species, including seven species new to Britain and four new to science. And if mention of the word ‘wasp’ makes you reach for a rolled up newspaper, don’t worry – most of these wasps are small and quite harmless, unless you’re a caterpillar or an aphid, and they make up one part of your garden’s free, volunteer pest-control service. You may not know they’re there, but you would soon notice if they weren’t.

From the start Jennifer reported her findings in scientific journals, but she soon also began to
communicate with a wider audience of gardeners. Early results were pulled together into a book, *Garden Life (1983)* for Chatto and Windus, and there were numerous articles in The Garden, New Scientist and a long series in the magazine Organic Gardening. The culmination of years of hard work, in 1991, was the monumental *The Ecology of a Garden: the First Fifteen Years*, published by Cambridge University Press. This remains compulsory reading for anyone seriously interested in garden wildlife, and was at the time the most complete account of the wildlife of any garden anywhere in the world. After a further 15 years, the complete story was published by the RHS as *Wildlife of a Garden: a Thirty Year Study*. Thirty years is long enough to record many changes, the reasons for some obvious, some less so. For example, the onward march of climate change is clearly shown by the arrival in the garden of gatekeeper and speckled wood butterflies, the former the most abundant butterfly in the garden (apart from the dreaded whites) when the survey ended in 2001.

Owen’s achievement has been to demolish once and for all the belief that gardens are wildlife deserts; it is now clear that the only reason anyone ever believed that was that no-one had looked. Her meticulous records of herbivore host plants also led her to the insight, still not universally accepted, that exotic garden plants can support a surprisingly high diversity of native herbivores. Again the reason is simple: for the most part, entomologists have ignored insects in gardens. Of course, this was only a study of a single garden, but other work (much of it inspired by Owen’s example) has only served to confirm her findings. We now know, for example, that bumblebee nests occur at higher density in gardens than in the countryside; that nests where bees can forage in gardens grow faster and survive longer; and that cities support six times the national average density of birds. With a very little effort, any garden – however small, however urban – can provide a home for a staggering range of (mostly unseen) wildlife. This is a timely message, for with recent declines in biodiversity in the wider agricultural landscape, gardeners have never had such a great responsibility for wildlife as they have today.

To find out more, read *The Ecology of a Garden* or *Wildlife of a Garden*. It’s only fair to say that to really enjoy the former you need to be very fond of both insects and long lists of Latin names, but it is packed with fascinating detail. The latter is more relaxed and accessible, and while still not exactly a book for casual reading or for the average weekend gardener, anyone with a serious interest in garden wildlife will find it utterly absorbing. You could read *No Nettles Required* which is my book describing our work on garden wildlife in Sheffield. But whether you decide you want to know a lot or a little about wildlife gardening, don’t forget that Humberstone is where it all began.
Many of you will know that I seem to travel quite a lot by aeroplane. When people ask me if I had a good journey, then I'm always pleased to be able to report that my journey was uneventful. I prefer the uneventful journeys to those that include the plane being hit by lightning, my luggage being lost, or being sat next to eight screaming babies for a transatlantic flight.

I'm pleased to say that this year's presidency has been a lot more uneventful than that of last year – you will recall that Leicester City Council had been proposing to charge us prohibitively high prices for renting the museum, to the point where it could have jeopardised the future of the Society. The previous president, Professor Stannard, and other members of the Society's Council were able to negotiate around this and we put in place a system of volunteer stewards. This means that two members of the Society volunteer each week to help permanent staff at the museum, as stewards with matters associated with security and safety. This has not proved to be onerous and we have had sufficient volunteer stewards this year to ensure that it is not necessary for an individual to do this very often. It is encouraging that the Mayor, Sir Peter Soulsby, invited Arts and Museums' volunteers to a reception on the 15th March and that the budget for the City, whilst very tight, protects the Arts and Museums Service from major cuts. It is clear that the relationship between the City, the Museum and the Society has grown stronger over the last year and that we should value and cherish this relationship and actively support it in a strong way.

By suggesting that the year has been uneventful, I would not like to give you the impression that the Society has been resting on its laurels. This year we have had a splendid programme of interesting lectures:

- Murder and skulduggery in Dickensian London was the theme of a talk by Dickens expert Dr Andrew Mangham, lecturer in Victorian Literature and Culture at the University of Reading. In his talk Dr Mangham he took the murder by Bill Sykes in ‘Oliver Twist’ as a starting point for considering Charles Dickens’s engagement with the forensic evidence of famous murder trials.
- At the end of October, geneticist and historian Dr Turi King spoke on ‘Vikings and Villains: Surnames, Genetics and Ancestry’. Dr King, a member of the University of Leicester’s Department of Genetics and the School of Historical Studies, discussed her research on the link between surnames and genetics and how this can be applied in the fields of genetic genealogy, forensics and population histories.
- In November, Nick Watson OBE, discussed whether, 650 Years on, “Is there a Future for Magistrates?” Nick Watson, who is Justices’ Clerk for Leicestershire and Rutland, gave a fascinating talk, also citing Dickens, and I think concluded that the future was bright.
- The Partnership lecture with New Walk Museum was given by renowned Picasso expert Dr Marilyn McCully, who spoke on the collection of Picasso ceramics gifted to the City of Leicester by Sheila and Richard Attenborough in memory of their daughter and granddaughter who perished in the Asian Tsunami in 2004. We learnt how the Attenborough Collection of Picasso ceramics was built up over some 30 years and the 140 works, including plates, jugs, bowls and some large pieces, reflects closely Picasso’s activity in fired clay during this period.
- Dr Kenneth McNamara, Senior Lecturer Dept of Earth Sciences, University of Cambridge gave the Joint lecture with the Geology Section on The Star-crossed Stone: the Archaeology, Mythology and folklore of Fossil Sea Urchins. He explored what Norse mythology tell us about the Vikings’ association of fossil urchins with hand axes; why another species of human 400,000 years ago made a hand axe with a fossil urchin in it; and why today we are still fascinated by five-pointed stars.
Dr Trevor Brown, University of Derby gave a very topical lecture sponsored by the Royal Society of Chemistry in January on the Use and Detection of Performance Enhancing Drugs in Relation to the 2012 Olympics, which illustrated the huge difficulties associated with this area.

Professor Guy Rutty MBE, asked the question “Is Autopsy Dead?” Professor Rutty’s principal work relates to the provision of forensic pathology services to HM Coroners and police forces of the East Midlands. I believe he concluded that Autopsy was far from dead.

In February we were privileged to hear from the VC of DMU on the “The Value of the Humanities”. In an era where state funding has been withdrawn from Art, Design, Humanities and Social Science tuition at universities, Professor Shellard’s lecture convinced us that the Humanities are essential to a civilised society.

Liz Kendall MP (for Leicester West) and shadow Minister for Care and Older People, gave a fascinating lecture on “The implications of changes in traditional, new and social media on parliament and the political process.” This raised a huge amount of discussion about the use and abuse of the internet.

Dr Joseph Phelan, Department of English, De Montfort University, gave a fascinating lecture on “Memorabilia: Robert Browning and Literary Celebrity” and revealed much about Robert Browning whose 200th anniversary we also celebrate this year. The talk examined Browning’s treatment of the themes of fame and popularity in his work, and in particular his unease at the public’s increasing appetite for stories about the private lives of public figures.

Ken Thompson gave a hugely enthusiastic presentation on “What do we know about garden wildlife?” in the joint meeting with the Natural History section. Not very long ago, many people thought gardens were virtual wildlife deserts. We now know that view is very far from the truth.

And finally we are promised an interesting evening, this evening, with another speaker from DMU, Professor Andrew Hugill, who will be talking about “Making Music with Computers” and includes musical examples and a performance of his ‘Pianolith’ for piano and digital sound.

Next year, the room that we’re now in is going to be subject to major redecoration works. Although it will be available for the first meeting, the remaining meetings of the Society next year will not be able to take place here. De Montfort University have kindly agreed to host the regular meetings of the Society.

The website of the Society has been improved considerably, thanks especially to Professors Andrew Hugill and Aftab Khan. Archived lectures are now available and it is clear that the website is of paramount importance to the Society. We will need to ensure that we can maintain and develop our web presence. It is anticipated that more of the transactions will be made available digitally, and in a way that makes their contents easily searchable.

Following Mary Hamill completing a long term as secretary at the end of the last session, we were left without a secretary for this year. Hilary Lewis stepped into the breach – for which we can be most appreciative. Karen Harris then kindly came forward, at the request of Jean Humphries, and has been taking over the responsibilities of the secretarial role since December. We are very grateful for that.

We were sorry to note that a past president of the Society (1989-90), Professor Peter Sneath FRS, passed away on the 9th September 2011.

I would like to thank all members of Council through whose actions this Society runs so smoothly. In particular, I would like to thank:

The Beesons whose title - of membership secretaries - belies the work they do every meeting in welcoming members through the door and sorting out refreshments, etc.

The Lewises for their vital work on arranging the programme and editing the transactions

Mr Michael Kirk whose advice we value as Treasurer

and the Website editors, Andrew Hugill and Aftab Kahn.
However, I would like to emphasise that all members of Council have been particularly active this year, and by not giving the many other members a particular individual mention, I hope that I am not offending them. It has been a great pleasure to work with such an active group of people.

I have pleasure in recording our thanks to the sponsors of the season’s lectures: University of Leicester; De Montfort University; Leicester Mercury; British Science Association and the Royal Society of Chemistry.

I would also like to thank the ever helpful staff at New Walk Museum who do everything possible to assist us. So that concludes my report for this not-very-uneventful year of the Lit and Phil and I would like to wish all success to Mr Kanti Chhapi who will take over the presidency from me for the next session.

**LEICESTER LITERARY AND PHILOSOPHICAL SOCIETY**

**ANNUAL STUDENT AWARDS 2012**

To mark the 175th anniversary of the Lit and Phil, the Society established annual prizes for students studying English at De Montfort University and The University of Leicester. The prize winners (one from each university) are selected by the Heads of the University Departments for their outstanding work.

Leicester University prize is awarded to the author of the best final year essay in the School of English. De Montfort University prize goes to the best overall graduating student of English. Two students shared the De Montfort prize this year.

**Summary from Isaac Lee, University of Leicester**

**Friedrich Nietzsche**

Nietzsche suffered a fatal stroke five months after Ibsen had been crippled by the same affliction and three months before Wilde’s death. It is possible that neither playwright learnt of Friedrich Nietzsche’s death. However it seems unlikely that either was ignorant of his work. ‘It is merely a moral prejudice that truth is worth more than appearance’ could easily be a Wildean epigram, and the alternative title of the quote’s true origin, Prelude to a Philosophy of the Future, would serve well as a title for Eilert Lovborg’s masterpiece in Hedda Gabler.

Art, Nietzsche seems to say in Beyond Good and Evil, is a twofaced creature, concealing just as much as it communicates. However art, he continues, is the future.

While Henrik Ibsen was interrogating dramatic art with the only tool as his disposal, dramatic art, Oscar Wilde was throwing his lot in with Nietzsche and with aesthetics, unaware that in five years he would living out Ibsen’s thought experiment.

The lure of heights is the lure of death, and as Nietzsche cries in his great work’s final poem, death is ‘Midday of life! My second youth’s delight’: a land where friends grow old and ‘none but new kith are native’. In an age when Oscar Wilde peers at us from the knot of Morrissey’s tie and Rosamund Pike brandishes General Gabler’s pistols like a character from a video game, is this the sunset of these second lives or another renaissance? Can we learn anything from squinting at the sun?
**Summary from Rebecca Jennings, De Montfort University**

**Authority and Clarity: Generic Convention in the Writings of James VI and I**

This dissertation strives to prove King James VI of Scotland and I of England’s worth as a writer of conventional Renaissance literature. Although they have repeatedly been deconstructed for what historical and political insights they contain, James’ writings have previously garnered little academic interest as literary works in their own right. ‘Authority and Clarity’ attempts to inspire such an approach by considering two of the common Renaissance genres in which James wrote: the advice book and the oration.

James’ advice book on the theme of kingship, *Basilikon Doron* (1599), is placed in a context and may be compared with a selection of contemporary advice books which have been widely accepted as typical examples of the genre. It can also be contrasted with a range of the Classical advice books of ancient Greek and Roman thinkers which formed the foundations and inspiration for the Renaissance generic conventions.

James’ speeches to his first English parliament (1604-1610) can be analysed in relation to the Classical models of oratory technique, held in reverence by Renaissance speech-writers. This approach with a close reading of the texts in terms of language, style, and structure, suggests that James’ writing is skilful and representative of contemporary generic convention. It also shows that James’ manipulation of these generic conventions with his unique authority as monarch, produces a distinctive and beguiling voice in his writings which make them texts which are both fascinating and worthy of study.

**Summary from Zeandrick Oliver, De Montfort University**

**Contemporary Poetry within 21st Century Culture**

This essay explores the position of contemporary poetry within 21st century culture applying Homi K. Bhabha’s cultural theories to a close analysis of the poetry of Jo Shapcott and Pascale Petit. This was achieved by analysing articles on published poetry to explore the relationship between capitalism, culture, and contemporary poetry. It aimed to see if poets such Shapcott and Petit structure their work with subtly subversive anticapitalist narratives. By focusing on their attitudes to the working class, I explored whether a select group of organisations and mainstream publishers perpetuated a type of stylistic elitism to maximise sales but provided their titles with a cultural validity by using predetermined stylistic values. It is argued that a poet's cultural value cannot be determined by sales alone under a hegemonic capitalist system. Arguments around style can lead to ‘the struggle of identification and the war positions’ as Bhabha notes. It is suggested that cultural competition ultimately serves the market and not cultural identity.
GEOLGY SECTION ANNUAL REPORT 2011-12

Officers 2011/2012
Honorary Life President: Dr Bob King
Honorary Life Vice-President: Dr Trevor Ford O.B.E
Chairman: Mark Evans
Acting Vice-Chairman: Dr Joanne Norris
Secretary: Fiona Barnaby
Treasurer: Roger Latham
Field Secretary: Helen Jones
Publicity Officer: Dr Joanne Norris
‘Charnia’ Editor: Andrew Swift
Webmaster: David Hayward
Student Representative: David Cavell

Committee Members
Dennis Gamble,
Julie Harrald

Co-opted Committee Members:
Dr David Baines,
Albert Benghiat,
Dr Ian Hill

Chairman’s Report, AGM,
March 21st 2012

Mark Evans, Geology Section Chairman 2011-12

This has been another busy and successful year for the section. Our Summer Field Programme started in April with a visit to the mineralogy collections of the Natural History Museum, ably hosted by curator Alan Hart. Visits to Pode Hole and Welton-le-Wold, both in Lincolnshire, followed, and our traditional Midsummer evening field trip was to Bradgate Park. The Section made welcome return visits to Cleeve Hill in Gloucestershire and Must Farm near Peterborough. Our annual joint meeting with the Warwickshire Geological Conservation Group toured sites in Oxfordshire, and we finished the year with a visit to Dudley Museum and the nearby classic Silurian locality of Wren’s Nest. The weekend excursion in June was to the Lake District under the leadership of Prof Mike Petterson of the University of Leicester, and was a great success.

The Winter Programme of lectures started in the first week of October with a talk by Dr Daniel Smith (University of Leicester) on prospecting for gold in the Solomon Islands. Prof. Roger Mason (London and Wuhan) gave us his new view of contact metamorphism and Dr Matt Friedman (University of Oxford) probed beneath the surface of early fish with synchrotron radiation. Dr Tom Argles (Open University) discussed the anatomy of the somewhat larger Himalaya, while Prof. Nick Petford (University of Northampton) discussed Icelandic ash clouds and their effects on air travel. Our Joint Lecture with the Parent Body was given by Dr Kenneth McNamara (Director of the Sedgwick Museum, University of Cambridge) on the folklore surrounding fossil sea urchins. They would seem to have been ascribed mystical significance for thousands of years. For our annual Christmas meeting we christened the new Geology Gallery at New Walk Museum; thankfully the newly restored floor escaped any serious spillages.

In the New Year, Dr David Unwin (University of Leicester) described the latest pterosaur discoveries from China, while Prof. Robert Cywinski (University of Huddersfield) shared his innovative research on the use of thorium as a source of nuclear power. Our Members’ Evening featured talks on a range of subjects from Albert Benghiat, Frank Ince, Dennis Gamble and Bruce Smith. Dr Joe Angseesing (Cheltenham) compared the contrasting fortunes of bivalves and brachiopods over geological time, and Ian Brown (Lafarge Aggregates) gave us a review of mineral extraction in the East Midlands. Once again we are pleased to report that the lectures were well attended, with an average audience of 50 per meeting. I would like to thank Joanne Norris for her help in putting the winter programme together.

The annual Saturday Seminar in March featured six talks on the theme of “Geodetectives: unravelling the Earth’s mysteries”. Once again the Section put on an excellent day, and we had 79 delegates, including 20 non-members. I would like to thank all the speakers and my fellow subcommittee members of Joanne Norris, David Baines, Fiona Barnaby and Roger Latham. The Section’s membership stands at a healthy 129. Our newsletter “Charnia” goes from strength to strength with some excellent editorials,
articles and meeting reviews, and the customary 3 issues were produced this year. Our website (www.charnia.org.uk) continues to be a valuable point of entry to the Section’s activities. This year we were saddened to see the passing of long-standing member John Dickinson, past member Arthur Cruickshank and friend of the Section John Aram. Finally, I would like to thank the committee and officers for their valuable assistance in maintaining the smooth running of the Section over the past year.

Mark Evans
Chairman LLPS Geology Section
21 March 2012

Geology Section Summer and Winter Programme 2011-12

Summer Programme 2011

Saturday April 9th
Department of Mineralogy, Natural History Museum, South Kensington, London
Leader: Alan Hart (NHM).

Saturday May 14th
Pode Hole, Lincolnshire
Leader: Bill Learoyd and Cliff Nicklin (Stamford Geological Society).

Friday June 3rd - Sunday 5th.
Weekend field excursion to the Lake District.
Leader: Prof Mike Petterson (University of Leicester).

Monday 20th June evening trip
Bradgate Park
Leader: John Carney (BGS)

Saturday July 9th
Welton-le-Wold, Lincolnshire
Leader: Helen Gamble (Lincs Wildlife Trust).

Saturday July 16th and Saturday September 3rd
Must Farm near Peterborough
Leader: Cliff Nicklin (Stamford Geological Society).

Saturday August 13th
Cleeve Hill, Gloucestershire
Leader: Joe Angseesing (Cheltenham).

Sunday October 2nd
Kirtlington and Oxford (joint meeting with Warwickshire Geological Conservation Group)
Leader: Paul Sargent (Oxford Geology Group).

Saturday October 8th
Dudley Museum and Wren’s Nest
Leader: Graham Worton (Dudley Museum).

Winter Programme 2011-12

All talks were held at 7.30pm in Lecture Theatre 3, Ken Edwards Building, on the main University of Leicester campus, except where stated. Refreshments served from 7.00pm.

2011

Wednesday October 5th
Dr Daniel Smith (Department of Geology, University of Leicester). Finding Solomon’s Gold.

Wednesday October 19th
Prof. Roger Mason (London): Contact metamorphism in Charnwood, the Lake District and China.

Wednesday November 2nd
Dr Matt Friedman (Department of Earth Sciences, University of Oxford). Taking a bite out of jawed vertebrate origins.

Wednesday November 16th
Lecture Theatre 2, Ken Edwards Building, University of Leicester
Dr Tom Argles (Open University). What are mountains made of? A Himalayan perspective.

Monday November 28th
Dr Kenneth McNamara (Department of Earth Sciences, University of Cambridge). The Star-crossed Stone: the Archaeology, Mythology and Folklore of Fossil Sea Urchins.
Wednesday November 30th
Prof. Nick Petford (Vice Chancellor, University of Northampton). Ash, planes and volcanoes.

Wednesday December 14th
Christmas Meeting, New Walk Museum, Leicester. A chance to explore the new Dinosaur Gallery.

2012

Wednesday January 11th
Dr David Unwin (Department of Museum Studies, University of Leicester). Frank, Mrs T and Xiao D – how Darwinopterus from the Jurassic Tiaojishan Formation of North-East China has transformed our view of pterosaurs.

Wednesday January 25th
Prof. Robert Cywinski (School of Applied Sciences, University of Huddersfield). Towards an alternative nuclear future?

Wednesday February 8th
Members Evening, New Walk Museum, Leicester

Wednesday February 22nd
Dr Joe Angseesing (Cheltenham): Bivalves versus brachiopods.

Wednesday March 7th

Saturday March 17th
Annual Saturday Seminar, University of Leicester. Geodetectives: unravelling the Earth’s mysteries.

Wednesday March 21st
Annual General Meeting and Chairman’s Address by Mark Evans (New Walk Museum, Leicester). Mine’s bigger than yours: the largest ever phylogeny of the Plesiosauria.
100 years of geochronology from Arthur Holmes to the present: How do we know the age of the Earth and Solar System?

Professor Randall Parrish, Department of Geology, University of Leicester

Arthur Holmes was a very remarkable earth scientist who on several fronts, made seminal scientific contributions that were decades ahead of his time. 100 years ago he published a remarkable paper that presented for the first time chemical measurements of the geological age of minerals that were placed within a stratigraphic context, demonstrating how the earth had to be billions of years old. In 1913 at the age of 23, he wrote a ‘little book’ entitled “The Age of The Earth” wherein he discussed all manner of implications of Earth’s antiquity and radioactive decay. In doing so, he laid the groundwork for a temporally-graduated geological time scale, for modern views about mantle convection, and for the science of geochronology using radioactive decay. This talk illustrates all of the modern pivotal methods of U-Pb geochronology that have defined the age of the solar system to 4567 Ma, demonstrated the separation of the Earth from this larger system some tens of millions years later, followed by the consolidation of the core-mantle-crust land-ocean-atmospheric Earth system as we know it. It will reflect on how we have used earliest solar system condensates, chondritic and metallic meteorites, samples returned from the Moon, and the Earth’s oldest materials (zircons) to work all of this out, and reflects on both the frontiers of geochronology and the astounding contribution Arthur Holmes made 100 years ago.

Plates vs. Plumes: A Geological Controversy

Professor Gillian R. Foulger, Durham University, Durham, UK (g.r.foulger@durham.ac.uk)

Mantle plumes were originally proposed by Morgan in 1971, who defined precisely their characteristics and predictions. However, subsequent research has been largely unsuccessful in confirming those predictions. Despite this, instead of the theory being abandoned as would have occurred, for example, in medical research if a drug were found to not produce the expected results, the plume model was progressively adapted to encompass unpredicted observations. Plumes have been proposed to come from almost any depth, to rise vertically or tilt, and to flow for thousands of kilometres laterally. They may
have narrow or broad conduits, no plume head, one head, or multiple heads. Often, several mutually inconsistent plume models have been proposed for a single “hot spot”, to account for data from different sub-disciplines within the Earth Sciences. Plume theory, as applied today, is so flexible it amounts to an unfalsifiable, data-independent, a priori assumption. In a quest to find models that fit the observations without ad hoc assumptions or appeals to coincidence, the “Plate” model has been developed. This attributes anomalous volcanism to permissive volcanism in areas of extension. The variable volumes of melt produced are attributed primarily to variations in source fertility. A third of all “hot spots” occur at spreading plate boundaries, and many lie in extending intraplate regions such as the East African Rift. Fertility may be imparted to the mantle by subducted slabs of oceanic lithosphere, and lithosphere delamination. Fertile mantle has a solidus as much as 200°C lower than that of standard depleted mantle peridotite and thus can produce more melt at the same temperature. This alternative model for the genesis of “hot spots” raises many new questions and challenges, and is ushering in a wealth of novel research problems previously unconsidered.


Please visit: http://www.mantleplumes.org/
The Silurian Herefordshire Lagerstätte: Soft-Bodied Sensations Released From The Rock

Professor David Siveter, Department of Geology, University of Leicester

Our understanding of the history of life on Earth relies heavily on the fossil record, and especially on rare cases of so-called exceptional preservation (lagerstätten), where soft parts of animals and entire soft-bodied animals are preserved. Such exceptionally preserved fossils provide an unparalleled view of animal palaeobiology and the true nature of animal biodiversity.

The lecture will illustrate on-going research on spectacular fossils from 425 million year old Silurian rocks of Herefordshire in the Welsh Borderland. This is a fossil biota of global importance, containing representatives of many major groups of animals. The fossils are being recovered and studied by tomographic techniques, resulting in the reconstruction of high fidelity three-dimensional...
‘virtual fossils’ that furnish remarkable anatomical details of the animals. These fossils are crucial in helping to fill a gap in our knowledge of the history of life and to resolve controversies about the relationships and evolution of animals still alive today.

![Figure: A brachiopod (Bethia)](image)

![Figure: An ostracod crustacean (Nymphatelina)](image)

**The secret life of metals:**
where do they come from and where do they go?

Andrew Bloodworth, British Geological Survey, Keyworth

The digital and environmental technologies which we rely on to deliver a prosperous, low carbon economy often contain metals which have previously been of little interest to man. Despite the fact that elements such as indium, rhenium, gallium and the rare earths are vital ingredients in a wide range of high technology components such as magnets, batteries, solar cells and display devices, our comprehension of their ‘ecology’ compared to volume metals such as copper, lead and aluminium is relatively poor. Consumption rates are rising rapidly and there is now an urgent need to better understand the origins and concentration processes of these elements in the Earth’s crust. We also need to maximise efficiency of use (do more with less), ensure that we recover and recycle these elements where possible and improve our understanding of what might happen if we lose them into the natural environment. This event will examine the secret life of ‘technology metals’, from their origins in the Earth, through their extraction, use, re-use and substitution by man, to their ultimate fate in the natural environment.

![Figures: Navachab open pit gold mine in central Namibia.](image)

![Figure: Different metal types including some alloys.](image)
Figure: An integrated circuit board (ICB) from a mobile phone - most of the elements in a mobile (about 60 in total) are concentrated in the ICB, many of these are so called critical metals which are vital to the operation of mobile digital devices.

Tracing visitors to our shores over the last 5000 years

Professor Jane Evans, British Geological Survey, Keyworth

One of the big questions in archaeology is: Do people move or do artefacts move? If you come across a burial in Britain of a person who has a beautiful Germanic brooch, can you conclude that the person is of continental origin, or simply that a German brooch was bought in Britain? At the larger scale the questions that are being asked are: was there a large influx of Saxons/Romans/Vikings into Britain who settled here and changed the culture, or did a few individuals, and their contacts, change the social habits of the indigenous population?

Isotope analysis is providing a method of addressing these questions because we can look at the composition of someone’s tooth and determine whether they came from the area in which they are buried, or if they are from elsewhere. This is done through the analysis of strontium and oxygen isotopes in tooth enamel. The strontium isotope composition can be used to relate a person, via geology, to the land on which they lived and derived their food, whereas oxygen isotopes reflect the climate zone in which they were raised. Together, these two “fingerprints” are providing us with new insights into the behaviour and movement of people in the past.

The picture that is emerging from studies of Bronze Age people in Britain is that they were very mobile and there is evidence for individuals coming to Britain from continental Europe.

The “Amesbury Archer” as he was named, was a 35-40 year old man buried close to Stonehenge in the richest Bronze Age burial on Britain. His grave contained many artefacts of which some were clearly of non British origin. Isotope analysis of his tooth enamel shows that he is very unlikely to have spent his childhood in Britain but is more likely to have come from an area near the Alpine foothills. This talk explains how isotope analysis on tooth enamel is undertaken and illustrates the technique with examples from different historical and prehistorical periods.

Figure: Sunrise at Stonehenge. Photo by B.

Figure: Flint arrow heads from the grave of the Bullock von Moos, with permission. Amesbury Archer. Copyright Wessex Archaeology, with permission.
The Earth After Us
Dr Jan Zalasiewicz, Department of Geology, University of Leicester

The Earth’s history is a 4.6 billion narrative that can be teased out, forensically, by the geologist from myriad clues preserved in the strata of this planet. It is a story of glaciations and global greenhouses, of the rise and destruction of mountain belts, of the evolution of life-forms both enigmatic - as our own local Charnia biota, for instance - and familiar: the ammonites, trilobites, mammoths and so on. But what position can the brief history of humans have within this almost unimaginably long narrative? This talk will consider the evidence, and the story, that might emerge as alien visitors explore the Earth, one hundred million years in the future.

These far future alien visitors will find no obvious traces, ruined cities, say, or skeletons in caves. They will have to consider the world of the underground - and become Terran geologists (and, more particularly, stratigraphers). Their journey to discover the Earth’s lost civilization will be lengthy and tortuous, with many geological puzzles – quite as long and involved as our own geological enquiries into the dinosaurs, and into what might have killed them off.

What might they find first? A long history of the almost immeasurably long life and eventful times of this planet, preserved in the strata. This geological archive is a by-product of plate tectonics: it is unparalleled in this Solar System, and probably rare in star systems generally. They will find trilobites, and ammonites, and dinosaurs too – and fossils of whatever animals and plants will follow the brief, geologically infinitesimal human reign.

They will find evidence (just as we do today), in the strata, of times of an abundant, diverse and stable biology, stable over long time-scales. They will also find times of environmental upheaval, of climate change, of changes to sea level and to ocean chemistry, of sudden reductions in biological diversity.

In one of these episodes of global change, there will be other geological signals, not seen in other of the past global perturbations. Geochemical anomalies, of metals, nitrogen, phosphorus. Enigmatic fossils. Signs of worldwide biological invasions. This will strike them as strange – just as we today, find the phenomena associated with the Permo-Triassic and Cretaceous-Tertiary boundaries puzzling, and fascinating.

Following these clues – often buried far underground, and only rarely at the surface – our future explorers will then, finally, stumble upon a petrified city, perhaps with human remains. And only then, can they begin to try to understand our long-vanished civilization.

Figure: The Earth after us.
Today, nearly four billion years after life first appeared on Earth, the planet hosts an abundance of complex life. Very recently, a new development—intelligence—has arisen. The varied and complex life on the planet today both maintains, and is supported by, fertile land and oceans and an oxygen-rich atmosphere. Life and the global environment have co-evolved such that neither would exist in its present form without the other. The lecture traced the critical ‘revolutions’ in Earth history that have brought the planet to this point (Figure 1). These can be briefly summarised as:

1. The ‘Inception’, involving the origin of life ~3.7 billion years ago and the establishment of recycling ecosystems fuelled by anoxygenic photosynthesis;

2. The ‘Oxygen’ revolution, started by the origin of oxygenic photosynthesis ~2.7 billion years ago and culminating in the Great Oxidation of the Earth’s atmosphere;

3. The ‘Complexity’ revolution, starting with the origin of eukaryotes and culminating in extreme glaciations and a Lesser Oxidation ~0.8-0.6 billion years ago.

Our planet is now in the midst of what might be a new revolution. A single species, namely our own, is in the process of transforming the planet. But for the first time in the history of the Earth the agents of planetary change have a dawning collective awareness that they are changing the world. We can’t be sure if this will come to rank alongside the great revolutions that made the present Earth, not least because it is very much still underway. So here we summarise the similarities between what is happening now and the past revolutions.
Common features of revolutions

There are several common features to the great revolutions that have made the present Earth (Figure 1). These can be broadly categorised as the main characteristics of change, and the features that must emerge for it to be “successful” – in the sense that permanent change persists and includes a thriving biosphere.

Two out of the three past revolutions have been underlain by a step change in information transmission between living organisms. An increase in the amount of information that can be passed on allows life to build more complex structures. Complex structures can in turn improve the information transmission mechanisms, allowing more information to be passed on, so these two processes mutually reinforce one another. The original example was the origin of the genetic code supporting prokaryote cells – and of cells supporting the mechanics of genes. The evolution of the eukaryote genome, simultaneously with the new structure of the eukaryote cell, was another. These revolutions in information and organisation do not of themselves lead to changes in their planetary environment. Rather, they light a fuse that can be very slow burning.

Changes of the planetary environment also require revolutions in energy and matter flow through the biosphere. Virtually all the important metabolisms of life evolved among prokaryotes, on the early Earth. The origin of DNA and prokaryote cells was the fuse for them. The most important and difficult-to-evolve example was the origin of oxygenic photosynthesis, an essential precondition for the Great Oxidation. The subsequent revolution eventually involved eukaryotes taking this already existing metabolism onto land and evolving ways to mine rocks for nutrients, with the consequence of boosting productivity both on land and in the ocean. Still these innovations in metabolism did not necessarily nor immediately lead to planetary-scale disruption.

The revolutions did however cause such disruption at the global scale once they began to interact with fundamental feedbacks in the Earth system. Strong positive feedbacks exist in the system, separating multiple stable states for planetary variables such as atmospheric oxygen, ice cover and temperature, which are locally stabilized by negative feedbacks. The Earth system can be knocked out of one stable state and into another by a change in forcing conditions or a significant perturbation. In the case of the oxygen revolution, the origin of oxygenic photosynthesis eventually knocked the system from a very low oxygen state into a higher one in the Great Oxidation. In the Neoproterozoic, it was pushed into a yet higher oxygen state. In both cases, changes in atmospheric composition triggered the strong, non-biological ice-albedo feedback, causing climate instability lasting tens of millions of years. Once these positive feedbacks took hold, major changes of the environment became unstoppable.

Whilst the combination of information revolution, energy revolution and instability in the system can start a planetary-scale revolution, there is no guarantee it will end well. Of course all the past revolutions had to have succeeded for us to be here to remark upon them. But we think there always lurked the possibility of failure – the system reverting back to an earlier state – or even of disaster – life wiping itself out. In each case, it required a revolution in recycling for the system to recover stability in a new state that supported a thriving biosphere. Recycling is so important because the Earth system is almost closed to mass and so all the elemental cycles must be very nearly closed. The biological innovations at the source of revolutionary changes in the environment involve the accumulation of a novel waste product – be it oxygen in the atmosphere, or the flushing of weathered elements to the ocean. To stop these waste products accumulating indefinitely, and maintain high productivity, it is necessary that new types of life evolve to form closed recycling loops.

For the Earth system to find a new stable state also involves the reassertion of negative feedbacks, which can involve the planetary effects of new metabolisms becoming self-limiting to their carriers. For example, we argue that the ending of snowball Earth events in the Neoproterozoic relied on the high oxygen, low carbon dioxide atmosphere created by land colonisers becoming limiting to them.
Does the present fit the pattern?

Comparing what is happening to the planet now with the start of previous revolutions the main preconditions appear to be at least partly in place.

The origin of language represents a revolution in the transmission of information, which has largely decoupled information flow from reproduction, and allowed a phenomenal acceleration of social evolution within our species. Natural selection still operates, but (unusually) it often does so more strongly at the level of human social groups than of individuals or genes. The information revolution has supported the emergence of complex social structures including hierarchical societies supported by agriculture, as well as the literal structures of the built environment. There are precursors of all these features among the social insects, most remarkably some fungus-farming termites that build towering air-conditioned nests. These insects achieve their communication using pheromones and touch. We humans on the other hand have evolved language, an entirely new system of communication, which has opened new horizons for the type of information we can share. We have taken society and industry to new levels, including building information processing methods and machines. These started with writing and clay tablets, accelerated with the invention of the printing press, and recently went into exponential increase with the invention of computers and the internet. Most of the information being transmitted appears to be junk (as it does in eukaryote genomes), and we are still a long way from creating a truly self-replicating machine. But optimists can at least see the potential for the emergence of yet higher levels of organisation, whilst pessimists warn that our machine creations will usurp us.

An energy revolution is also underway. Once we realised we had a plentiful source of energy – in the form of fossil fuels – and the ability to make use of it, we set about exploiting it, thus following the same evolutionary imperative that photosynthesisers and land colonizers followed before us. This time the ability to make use of fossil energy was not a metabolic innovation but a suite of technological ones. But just as those organisms gifted with oxygenic photosynthesis came to dominate the planet, those societies with the technology to make the swiftest and greatest use of fossil fuels have become the dominant ones. The flow of fossil energy through human civilisation is now about a tenth of the size of the flow of solar energy through the biosphere as a whole. Only a small fraction of this energy is going into supplying our biological needs for food. Much of it is being used for heating, cooling, transportation, construction, and information processing. Of course a fundamental problem is that fossil fuel reserves are finite. Our fossil-fuelled societies are like respiring organisms arriving in a world full of food, but without any primary producers – soon enough they are doomed to a meagre existence unless they can evolve the equivalent of photosynthesis. If our dependence on fossil fuels continues then this energy revolution will sooner or later stall in its tracks. However, diverse alternative sources of energy are actively being developed and used. Energy demand continues to increase in a roughly exponential manner despite population growth slowing down, and we see no fundamental reason why humans will not continue to meet that rising energy demand.

A third similarity with previous revolutions is also in place; the Earth system is subject to strong feedbacks and is prone to instability. Instability is abundantly clear in the recent geological record of climate change, with the planet oscillating between glacial and inter-glacial conditions. The oscillation has recently got larger in magnitude and longer in period. In the last million years, its shape has changed to a saw-tooth in which ice ages end in abrupt warming dominated by positive feedback, temporarily in a runaway state. Although all our civilisations have developed in a 10,000 year interglacial interval of apparent stability, underlying positive feedbacks are still there. The PETM event 55 million years ago shows that the Earth system can propel itself into a much warmer state. On the flip side, the snowball Earth state might still be available. It’s not just the climate either, the ocean is still potentially vulnerable to being pushed into an anoxic state, and we have already collectively demonstrated that the ozone layer can be disrupted. Whichever direction we push the Earth system, the key point is that if we push it too far there are positive feedbacks that can act to continue carrying the system in that direction, toward a new stable state.
Making it a success

So, the main preconditions for an Earth system revolution appear to be in place, but what will it take for this to be a successful revolution? The past revolutions of the Earth had to be successful in order for us to be here at all, but that does not mean it was inevitable or even likely that they would succeed. It could be that success is rare and failure (reversion to an earlier state) or even disaster (the wiping out of life) is the more likely outcome. It is just that we could only have evolved on the rare, fortunate planet that, after the inception of life, got through at least two more dangerous (and potentially fatal) revolutions. If humans represent the start of another revolution, there is certainly no guarantee it will be successful, and at present the omens don’t seem very promising that it will be.

The one obvious thing that is missing, which was needed to make previous revolutions successful, is recycling. As our collective energy use has rocketed up, so too has the dumping of waste materials in our surroundings. The past revolutions were also driven by new sources of energy and materials tapped by the biosphere, but ultimately they were only successful because the system “learned” to recycle the materials needed by the innovators from their waste products. Environmental regulatory feedbacks also kicked in which stabilised the system. Typically it took tens of millions of years for these solutions to arise. During that time there were major swings of climate that could have destroyed the emerging system. Fortunately, we are equipped with intelligence and imagination, and we ought to be able to foresee and understand these dangers. Thereby we could avoid them, and also the millions of years of climatic upheaval that previously had to be endured before the “blind watchmaker” of evolution, and the reorganisation of feedback loops, restored a smoothly working global system.
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Mrs D Cooper B Sc
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Co-opted: Dr A Bevington as Webmaster

An Extraordinary Committee Meeting was held on
9th March in advance of the AGM to discuss the
Section’s response to a letter received by the Parent
Body from the Museum Service. This set out charges
for the use of rooms and facilities at New Walk
Museum for evening meetings in order to cover the
cost of providing the necessary security staff. In view
of the long standing association of the Society with
the Museum, the charges would be phased in over
three years. For the Section’s use of the Lord Mayor’s
Rooms the cost would be £10 per hour for the first
year, £25 for the second and the full cost of £51.70
in the third. The treasurer had prepared a budget
forecast for the Section; as a result of which it was
agreed that the Section would meet the charges for
the first year without raising subscriptions and for the
second year by cutting down on the number of
meetings or by raising the subscriptions. After that the
Section would have to find alternative accommodation.

This situation was outlined to the section at its AGM
on 30th March 2011 and generally accepted, but
with much regret, especially the use of the Museum’s
collections to illustrate speakers’ lectures. It was
hoped that the ongoing negotiations by the Parent
Body, whereby voluntary stewards drawn from the
membership would assist the Museum staff, will
overcome the need for room charges.

Rosie Smith stepped down as Chairman and Doreen
Thompson as Vice Chair and will be replaced by Ivan
Pedley and John Tinning, who will share the
Chairman’s duties. Beverley Lambie resigned as
Secretary and Doreen Thompson as Minutes
Secretary. With no offers from the membership Peter
Thompson agreed to act as Secretary on a temporary
basis. The officers and committee were thanked for
their hard work over the year, especially those
retiring and especially Doreen Thompson who has
minuted our meetings since 1983 as well as being
newsletter editor for 25 years. Ray Morris and Alan
Ottewell both stood down from the committee. Peter
Thompson remains as our representative on the
Parent Body Council. These members were thanked
for their individual contributions.

We also thank Ann Pinnock for providing the coffee
at our evening meetings and Jean Cooper for her
excellent buffet which we enjoyed at the close of our
meeting.

The Spring committee meeting was held on 20th
April and the good news was that the Museums’
Service had accepted the offer of voluntary stewards
trained to help the Museum staff supervise the
evening meetings.

Speakers for the 2011/12 winter’s session were also
discussed.

The autumn committee meeting was held on 29th
November. Regarding the implementation of the
Museum’s warden scheme, our five volunteer
stewards had received training in the use of radios
and areas to be covered in the Museum.
A variety of venues and leaders was suggested for the summer programme and although organised bus trips for long distance excursions was considered, it was not thought practical.

Peter Wilkinson resigned from the Summer Programme sub-committee and was thanked for his work on the committee. Raita Hayes has taken on the duties of Secretary and Hazel Graves has agreed to become Minutes Secretary.

Winter meetings were held at fortnightly intervals to hear the following speakers. The average attendance was 20.

January 5th  
Madagascar  
Mike Webster

January 19th  
Shieldbugs  
Dr Tony Cook

February 2nd  
The Future of Natural History  
Brian Eversham

February 16th  
The Toads of Coleorton  
Dr Rob Oldham

March 2nd  
Farming and Wildlife  
Julia Hawley

March 16th  
Update on Leicestershire Mammals  
Dr Helen O’Brien

March 21st  
Story of Rutland Water,  
Tim Appleton (Joint meeting with LLPS)

March 30th  
AGM, Quiz & Social evening

The Summer Programme of field meetings was as follows. We were fortunate with the weather and all meetings were well attended.

May 7th  
Burley Wood  
Phil Rudkin

May 21st  
Cribb’s Meadow  
Jenny Harris

June 4th  
Burrough Hill  
John & Shelagh Tinning

June 18th  
Fineshade Woods  
Doreen & Peter Thompson

July 9th  
Loughborough Big Meadow  
Peter Gamble

July 23rd  
Brentingby Meadows  
Julia Hawley

August 6th  
Collyweston  
Jan Dawson

August 13th  
Priory Water  
Frank Clark

September 3rd  
Charnwood Lodge  
Stuart Moffat

September 24th  
Calke Abbey Park  
Bill Cove

October 2nd  
Ketton Quarry  
Richard Iliffe

Winter meetings began on October 12th with a members Exhibition & Photography Evening followed by:-

October 26th  
From Moses to Roses  
Ed Morrison

November 9th  
The ID & Ecology of British Deer  
Dave Stretton

November 23rd  
Re-introducing Water Voles to Rutland Water  
39th Sowter Memorial Lecture  
Lloyd Park

December 7th  
Bird Migration  
Nigel Slater
Leicester Literary and Philosophical Society Programme 2011-2012

All lectures held in the Permanent Collections Gallery
New Walk Museum on Mondays at 7.30pm
www.leicesterlitandphil.org.uk

3rd October 2011

CHAOS AND FRACTALS: SCIENCE MEETS ART
President’s Address
Open Meeting to be followed by a social gathering
The Lord Mayor will be present

17th October 2011

CHARLES DICKENS AND THE ANATOMY OF MURDER
Dr Andrew Mangham
Lecturer in Victorian Literature and Culture
University of Reading

31st October 2011

VIKINGS AND VILLAINS: SURNAMES, GENETICS AND ANCESTRY
Dr Turi King
Research Fellow Project Manager on the Impact of Diasporas on the Making of Britain
Department of Genetics University of Leicester

14th November 2011

650 YEARS ON, IS THERE A FUTURE FOR MAGISTRATES?
Mr Nick Watson OBE
Justices’ Clerk for Leicestershire and Rutland

21st November 2011

Lecture held in partnership with New Walk Museum
PICASSO CERAMICS: THE ATTENBOROUGH COLLECTION
Dr Marilyn McCully
Picasso Specialist and Curator of New Walk Museum Picasso Ceramics Exhibition

28th November 2011

THE STAR-CROSSED STONE: THE ARCHAEOLOGY, MYTHOLOGY AND FOLKLORE OF FOSSIL SEA URCHINS
Dr Kenneth McNamara
Senior lecturer Dept of Earth Sciences University of Cambridge
Joint lecture with the Geology Section

9th January 2012

THE USE AND DETECTION OF PERFORMANCE ENHANCING DRUGS IN RELATION TO THE 2012 OLYMPICS
Professor Trevor Brown
Professor of Applied Materials Chemistry
University of Derby
Sponsored by The Royal Society of Chemistry

23rd January 2012

IS AUTOPSY DEAD?
Professor Guy Rutty MBE
Home Office Registered Forensic Pathologist
Sponsored by The British Science Association

6th February 2012

THE VALUE OF THE HUMANITIES
Professor Dominic Shellard
Vice Chancellor De Montfort University
Sponsored by De Montfort University

20th February 2012

Leicester Mercury Media Lecture
DEMOCRACY AND THE MEDIA
Ms Liz Kendall MP
Member of Parliament for Leicester West
Sponsored by Leicester Mercury
5th March 2012

MEMORABILIA: ROBERT BROWNING AND LITERARY CELEBRITY
Dr Joseph Phelan
Reader in 19th Century Literature Department of English De Montfort University

19th March 2012

WHAT DO WE KNOW ABOUT GARDEN WILDLIFE?
Dr Ken Thompson
Research Fellow Department of Animal and Plant Sciences
University of Sheffield and Garden Writer
Joint Lecture with the Natural History Section

23rd April 2012 (NB 7.00 pm)

ANNUAL GENERAL MEETING
To be followed by a lecture
MAKING MUSIC WITH COMPUTERS
Professor Andrew Hugill
Director of the Institute of Creative Technologies
De Montfort University
Wine will be served during the interval