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Book reviews, reminiscences, obituaries or appreciations of prominent current or past members should be up to 800 words in length.

Articles will be refereed and a report sent to the author(s).

Contents

PROCEEDINGS

Dr Susan R Hilton M.B. Ch. B., DRCOG, MA, FPPH
President 2018–

President's Report

I was honoured to take over the role of President in September 2018 from my very efficient predecessor, Dr Diana Leitch, and have attempted to keep up her excellent work over the previous 2 years. It has been a busy but enjoyable year, and I have been aided by all the members of the Council, who put in so much time and hard work for the Society - Vice-Presidents Chris Baker and Tony Jackson have provided invaluable advice and support, as have the Honorary Secretary Peter Hilton and the Honorary Treasurers Trevor Rees and Greg Mauchline, all of whom are staying in their roles during the coming year (though we are seeking a replacement for Peter Hilton, who has completed his term of office). The section Chairs – Desmond Winterbone (Science and Technology), Patricia McWilliam-Fowler (Arts), Peter Barnes (Social Philosophy), and Angus McDougall (Young Peoples) have all run their committees efficiently, and provided the lectures for each section in good time, and are very advanced into the planning of more for the next season – and beyond. Prof Graham Booth has produced another set of *Manchester Memoirs*, which is available free to all members online, and the book is full of very interesting and detailed information about the Society's activity over the previous year. Elected Council Members Chris Boyes, David Brailsford, Ronald Catlow, Joanna Lavelle, and Kenneth Letherman have all contributed ideas and practical help in many ways.

The 2018 AGM was held on 27 September, followed by a very interesting talk from the outgoing President Dr Diana Leitch. Council itself organised 6 lectures (see the summary of each for details), along with two Christmas social events. There were also five extra-mural visits during the year. The Science & Technology section organised seven lectures, and three afternoon seminars; the Arts section had seven lecture slots, and three theatre visits, along with one guided Peterloo walk; the Social Philosophy section organised six lectures; the Young Peoples Section produced three lectures specifically aimed at sixth formers and undergraduates, as well as attracting many of our regular members. The quality and depth of each event was universally high, in keeping with the ongoing tradition of the Lit & Phil. As we approach our 238th year since the Society was founded (in 1781), the events planned for the coming season look very much to be of the same high standard. This is the result of the hard work of each of the Sections, and I thank each Section committee for their continuing enthusiasm and time.

At the end of 2018, our two professional administrative staff, Julie Brockenshaw and Kathryn Slater both decided, for completely different reasons, to move on to pastures new, and finished work with us at Christmas. We wish them well in their new careers. In October interviews were held for their replacements and we were very pleased to have such a high calibre of applicants. Six were shortlisted and interviewed, and we offered the jobs to two candidates – Rachel Croft and Aude Nguyen Duc. They both have extensive experience in event and

office administration and have been working tirelessly and enthusiastically ever since, with many creative ideas. Their marketing experience, IT skills, and many other talents have helped the Lit & Phil to run even more efficiently, and we are very grateful to them for all they do for the Society.

Thanks also go to Malcolm Brown (a member of the Lit & Phil) who has given me much help in the organisation of the Council Lectures, along with Chris Boyes and David Brailsford. Vice President Chris Baker also continues to analyse much statistical information - regarding attendance at lectures, cost per lecture, and much else, which helps us to plan our way forward. We are also in the process of evolving a major strategic plan, in order to produce realistic and achievable goals for the coming five years. Thanks again to Malcolm Brown for facilitating this and giving us the benefit of his professional experience. I realise that such plans have been made several times in the last 16 years, but many restrictions, mainly financial, and lack of time (we are volunteers, after all) have meant that many aspirations have been unachievable. However, I hope that good things will emerge, which will benefit the Society in the short and long-term – especially as there are increasing numbers of societies and organisations who have similar events to ours, which are providing competition. The role of social media is also a fast-emerging factor, and we are trying to keep up with this as much as possible. For example, a morning seminar on the use of Twitter has been organised for July.

Social activities are also important for many of our members, and we continue to arrange an evening meal after most lectures, to which about 30 members, on average, attend. They are excellent ways of getting to know fellow members and have some interesting conversations. Just before Christmas two members' 'drop-ins' were held again at the Council offices, where members got together for refreshments and drinks. At the second one we were able officially to say goodbye to our administrators, who were leaving us, and also welcome our current staff. Over the spring and summer of 2019 several extra-mural visits have been held, in and around the city centre (see Council lecture summary for details), which have proved popular. I hope to continue to have similar events in 2020, and several are in the advanced stage of preparation.

Lecture venues are mainly at the Royal Northern College of Music, and the Manchester Conference Centre, but other venues are still being actively considered. There are many venues in the city, but the cost of most are beyond our budget/do not have catering/have access problems, etc.

Following on from the first members' survey in 2017/18, there is also an ongoing second survey, which will be reported upon at the 2019 AGM. We listened carefully to the comments of the first survey and tried to respond to as many of these as were practical. We value comments and suggestions at any time of the year, of course.

The Treasurers have continued to review the Society's finances and regularly report on these at each meeting of Council. They regularly review our investment portfolio with our investment advisers, Brewin Dolphin, and report their findings to Council. The Society continues to be funded by the investment

income, along with members' subscriptions. Membership numbers have fallen a little this year, and Council is continuing to look at ways to reverse this trend, whilst giving members value for their subscription fees.

We have expanded the use of the larger of our offices at Church House on Deansgate. As well as holding committee, Council, and other meetings there, it has been used for seminars, as it can hold about 30-35 people comfortably. IT facilities are now working well, so we hope to use the space more fully in the future.

Looking to the future, I am sure that Council and the Section Committees will continue to produce excellent topics and lecturers, of interest to many of our members. We encourage any member who wishes to take part in a committee to put their names forward. Due to the constitution of the Society, terms of office come to an end. Professor Kenneth Letherman has reached the end of his term on Council in September and I thank him for all he has done for the Society over many years. Professor Graham Booth, our Manchester Memoirs editor, continues to produce an excellent record of the lectures given in a particular year. I thank him for his tireless work on this. Our Honorary Librarian, Mrs Christine Chappelle, continues to sort and catalogue our archives on a weekly basis throughout the year, so, many thanks to her.

Our termly brochures are currently being composed, and it will have a new look this year (for the 2019-20 academic season). A copy was sent to all members in August and it will be launched to the wider public on the 6th September, which happens to be John Dalton's birthday. As always, full information about the lectures and events is on the website and a monthly newsletter is sent out, containing news, up-dated details about the Society's activities.

Finally, I wish to thank all our loyal members for their continuing support of this great Society, and hope that membership will continue to be renewed – as well as all new members who have joined during the last season.

Dr Susan R Hilton M.B. Ch. B., DRCOG, MA, FPPH
President 2018-

Film poetry: Humphrey Jennings Listening to Britain

ALAN SENNETT

29 January 2019

In an article written years after his untimely death in 1950, Lindsay Anderson referred to the late film-maker Humphrey Jennings as 'the only real poet that British cinema has yet produced'.[1] The present article asks whether film propaganda can really be poetic? It does so through an exploration of one of Jennings' wartime propaganda films, *Listen to Britain*, which is often said to evoke deep emotional responses among British viewers born long after the war.

Jennings was born in Suffolk in 1907 to artistic parents. His father was an architect and his mother a painter. Jennings is often described as a polymath, interested in all the arts, but also in science and engineering.[2] He became known in the 1930s as a British surrealist and a founder of Mass Observation. But more importantly at that time, Jennings was a key figure in the British documentary film movement. As for so many of his generation, his great moment would be the Second World War. Working from 1934 for Grierson's GPO Film Unit that morphed into the Crown Film Unit in 1940, under the auspices of the Ministry of Information, Jennings sought to project an image of a Britain under attack that was culturally varied, democratic, progressive, tolerant, good-humoured and possessing a rich history. It would be Jennings, more than any other single filmmaker, who would construct the cinematic propaganda image of the 'people's war' and offer a vivid portrait of the nation at war in sound and pictures.

After gaining a First in English at Cambridge and going on to pursue post-graduate work, Jennings abandoned a promising academic career to work as a photographer, painter and theatre designer. He joined the GPO Film Unit largely for the money after the birth of his first daughter. While at the GPO, he became involved with a group of British Surrealist artists and helped organise the June 1936 Surrealist Exhibition in London together with Roland Penrose and Herbert Read. The Surrealists sought to release creativity from the constraints of reason by exploring the unconscious mind. They were interested in recording dreams, automatic writing, word games and artworks which juxtaposed unusual objects and used 'ready-made' art or 'found objects' such as Marcel Duchamp's urinal. Much was made of the surrealism of everyday life such as a stone elephant on top of a bleachworks in Bolton. Although Jennings' own art had been figurative and modernist, he had a lively interest in surrealism with its mix of quirky fantasy and political radicalism. He visited Paris and met surrealists including André Breton.

Perhaps inspired by his encounter with social realist filmmaking at the GPO Film Unit, Jennings moved on from the Surrealists to engage in activities closer to the concerns of ordinary people. Mass Observation developed as a way of documenting people's everyday lives after the abdication crisis of late 1936. The popular obsession with monarchy shocked many Left-wing intellectuals because it revealed the powerful hold the institution still had over ordinary people's affections and eclipsed major ongoing events such as the civil war in Spain. It was clear that British intellectuals were often woefully ignorant of mass concerns. In 1937, Tom Harrisson, Charles Madge and Jennings teamed up and founded Mass Observation (MO) with the aim of studying public attitudes with the passion and precision that anthropologists applied to the study of tribal cultures. By late 1937, over 500 volunteers were recording in detail everything they did from waking to sleeping on the 12th day of each month for a year. It provided a record of qualitative evidence about ordinary lives, perceptions and behaviours. In due course, special days such as Easter and August Bank Holiday were recorded in the same way. MO reports would furnish a unique archive dealing with everything from people's personal lives to how they spent their free time. Bolton was taken as a barometer of popular attitudes and renamed 'Worktown'.

Jennings' involvement with MO was brief, yet formative. He helped edit some of the first volumes of MO reports and designed the covers. He felt that MO created a new kind of documentary literature and it informed his own forays into filming working-class life and preoccupations. There is also a connection between the experimental writing of French surrealists and some of the bizarre facts unearthed by Mass Observation. According to MO, for instance, in Bolton, a 'tough' man in a pub suddenly took a tortoise out of his coat.[3]

From 1934 to 1939 Jennings worked primarily for the GPO film unit on a dozen or so films in various capacities as director, writer, editor and set designer. Perhaps the highlights were the 1936 colour puppet fantasy, *The Birth of the Robot* for Shell-Mex BP, directed by Len Lye, for which Jennings provided the Colour Décor, and the 1939, *Spare Time*. The latter was an 18-minute GPO Film Unit production written and directed by Jennings which was made for the New York World Fair. It offers a remarkable portrait of British working-class life that focuses upon leisure pursuits. As such the film does not engage with the social and economic issues that were the mainstay of British social documentary film of the 1930s, but instead offers a collage of sequences that include, among other things, a kazoo marching band, tigers at Manchester's Belle Vue, wrestling, brass bands and choirs. In stylistic terms it does away with the documentary narrative and thus avoids a judgement on working class pastimes and, instead, lets the culture speak for itself.

Jennings' early period with the GPO Film Unit was often a difficult one, with *Spare Time* receiving unfair criticism for having a somewhat patronizing attitude towards the northern working class. Yet his talents as a filmmaker are clearly displayed in these films and they foreshadow his wartime propaganda

masterpieces. Indeed the work of the Crown Film Unit is especially well-remembered due in large measure to Jennings' work on films such as: *London Can Take It* (1940); *Words for Battle* (1941); *Listen to Britain* (1942); *Fires Were Started* (1943) and *The Silent Village* (1943). These were often short films of between 10 and 20 minutes duration, although the last two were longer. In 1945, right at the end of the war, he made another longish film, *A Diary for Timothy*, that focused upon the opportunities for building a new Britain that plays particularly well in the context of the post-war Labour Government.

Figure 1: Humphrey Jennings rehearsing Dame Myra Hess at the National Gallery.

Of all Jennings' wartime films, perhaps none captured the spirit of the 'people's war' propaganda message more poetically and arrestingly than Listen to Britain. Lindsay Anderson considered it his 'most completely successful work'. This was a 20-minute film co-directed with Stewart McAllister. This film displays, perhaps better than any other, Jennings' poetic sensibilities and his ability to elicit an emotional response. As the title suggests, the film is composed of a sound and vision portrait of Britain at war over a 24-hour period, starting in the afternoon. Drawing upon footage shot over many months, the film developed from an initial idea of a film of one of Myra Hess's popular lunchtime concerts at the National Gallery into a much broader sound portrait of Britain, from the Lake District to Blackpool, Manchester and London. During the genesis

of the film a great deal happened, not least the German invasion of Russia in June 1941. This brought the Soviets into the war on the Allied side, a factor that gave Jennings a great deal of optimism, although he was far from being a Communist, of course. Indeed his politics can best be described as those of a left-wing patriot, rather in the way Orwell expressed it in his essay The Lion and the Unicorn, published in February 1941, and much praised by Jennings in a letter to his wife.[4] In many ways Listen to Britain depicts in visual terms Orwell's argument that 'In England patriotism takes different forms in different classes, but it runs like a connecting thread through nearly all of them'.[5] Jennings offers a seamless journey through 1941 British culture. We begin with country sounds of the lark, and move through the thousand-horsepower roar of Rolls Royce Merlin engines of Spitfires, to Joseph McLeod reading the six o'clock news. Next we see and hear a dance band at the Tower Ballroom in Blackpool, the clatter of wartime heavy industry, horses' hooves, popular and folk songs like 'Roll out the Barrel', 'Home on the Range', 'The Ash-Grove'. We hear the BBC Overseas Service, Music While You Work, bells and whistles of factories, with Flanagan and Allen's 'Round the Back of the Arches' segueing into Myra Hess playing Mozart's Piano Concerto in G at the National Gallery. It all conjures up a picture of the people standing together, despite social class differences, for a common purpose.

Jennings' portrait is not of a classless society, but of one united in endeavour, spirit and determination. The war is certainly evident in the men and women in military uniforms, the armaments factories, the aircraft and military vehicles – Bren-gun carriers roaring through an English village, for instance. Yet there is no direct reference to the fighting, or even to the enemy. There is no need from a propaganda perspective to say that Britain is fighting a justified war against vile and tyrannical opponents. People are already convinced of that. The propaganda message here is affirmative and empowering: the freedom to listen to what we choose, whether popular or classical music, to congregate together at a concert of German music and listen to the BBC broadcasting in many languages, or many other forms of cultural and social expression is all self-evident to the audience.

Yet it would be a mistake to underestimate the film's careful construction and staging. The sequences of Queen Mary and Kenneth Clark, the men and women in uniform talking at the dance, the Canadian soldiers singing, and the children dancing are all examples of staged scenes. Yet Jennings and McAllister, who evidently played a key role in the direction and editing of the film, were astute enough not to reshoot scenes to get everything perfect as a feature film production might. The young girl who gets out of step in the playground dance is left in and lends an air of authenticity to the scene.

In stylistic terms the film employs the technique used to brilliant effect in *Night Mail* of recorded sound overlays, as well as diegetic voices and music. Sound is used to counterpoint the images and create a cinematic composition of sounds and images. But if the film is rich in soundscape, it is even richer in its images of people. We are not offered an idealised view of a heroic populace, but

Figure 2: Jennings (left) stretches up to touch a piece of sculpture in Poets' Corner, as he suggests a shot for Camera Operator Chick Fowle of the Crown Film Unit, January 1941. Ministry of Information Photo Division, from the collections of the Imperial War Museum

rather naturalistic visions of often tired faces. The film was genuinely popular with wartime audiences because it reflected and amplified scenes and emotions that people could identify with. Although it was clearly a piece of propaganda, it had an essential truth to it that resonated with people who identified themselves in the film. One factory sequence shows a woman skilfully operating heavy machinery, as many did. There is little in the way of gender division here. Jennings' aesthetic awareness is also displayed in his use of what was probably a large reproduction of the 'The Battle of San Romano' by the Italian Renaissance painter, Paolo Uccello. Most original canvasses, and probably this one too, had already been removed from the National Gallery for safe-keeping. Here Jennings uses the picture to add to his range of cultural references in the film and also as a backdrop for a shot of a young woman listening intently to Myra Hess playing Mozart. The camera treats its varied subjects with great respect, often displaying Jennings' painterly sense of composition and surrealist liking

for juxtaposition and humorous commentary. Note the art gallery full of empty frames, for instance.

While the film was well received by the general public and by audiences in America, it was not universally praised by his fellow documentary film makers at the time. Some, like Edgar Anstey, felt it to be indulgent and romanticising of wartime Britain, hence poor propaganda. Certainly, the film lacks a conventional propaganda approach: the enemy is not vilified, or even mentioned directly, nor are there any shots of wartime leaders in striking poses. Yet it is deeply propagandistic in a subtle way. Propaganda is often most effective when it speaks to those who are partially or wholly convinced of the truth of its core message. The propagandist deals with ideas, perceptions, and emotions that already have social currency. Often the most effective propaganda involves the truth or, at least, a version of it. Arguments that appeal to something an audience perceives to be true or real may permit the propagandist to gain its trust. This seems to be the case in abundance with *Listen to Britain*, where it is never necessary to overtly state the propaganda message.

Discussing propaganda in Nazi Germany, Steve Neale has noted that the 'specificity of propaganda' resides in the 'use to which a particular text is put, to its function within a particular situation, to its place within cinema conceived as a social practice'.[6] He stresses the contemporaneity of propaganda works, suggesting that 'propaganda places the spectator in relationships with discourses and practices existing outside of the text'.[7] An audience may be in agreement with some elements and in conflict with others. But this relationship may change over time. Hence, what functions as 'propaganda' in Britain of the mid-1940s may not do so once the external practices and discourses alter. Thus the 'moment of propaganda' is not simply defined by the political message of the film but through its relationship to a specific historical conjuncture. This suggests that when considering the politics of art, we need to examine the viewing context as much as the intentions of the producer and its conditions of production. It is notable, though, that what strikes many more recent viewers of *Listen to Britain* is the way in which the film retains much of its emotional force, even among those born long after the end of the Second World War. This suggests that the film transcends its 'propaganda moment' and has become something much more enduring as an artistic portrait of Britain at an existential moment in its national past. It presents a view of a decent, cultured, entrepreneurial, industrious, free, tolerant and good-humoured society defending itself against a threat that does not even need to be named.

References

1 Anderson, Lindsay, 'Only Connect: Some Aspects of the Work of Humphrey Jennings'. *Sight and Sound* 23 (4) (Apr. 1, 1954): p 181. Reprinted in Ryan, Paul, [Ed.] *Never Apologise: The Collected Writings* (Plexus, London 2004), pp. 358–365.

2 See the biography of Jennings: Jackson, Kevin, *Humphrey Jennings* (Picador, London 2004).

3 Cited in Graham Roberts, 'Soluble fish: How surrealism saved documentary from John Grierson', in Harper, Graeme and Stone, Rob [Eds.], *The Unsilvered Screen: Surrealism on Film* (Wallflower Press, 2007) p 95.

4 Cited in Jackson, Op. Cit. p 246.

5 Orwell, George, *The Lion and the Unicorn: Socialism and the English Genius* (Searchlight Books, 1941).

6 Neale, Steve, 'Propaganda,' *Screen*, 18, no. 3 Fall, 1977 p 39.

7 Ibid. p33 n3.

Dr Alan Sennett studied modern history at Sheffield City Polytechnic, took an MA in Political Sociology at Leeds University and obtained a PhD from Manchester University. He works for the Open University, Liverpool University and various adult educational organisations in addition to freelance lecturing, research and writing. He is part of the Manchester Continuing Education Network (MANCENT) that delivers adult education courses of university level in the North West. His main areas of research and publication concern the Left in the Spanish Civil War and film propaganda. He is the author of Revolutionary Marxism in Spain, 1930–1937 *(Brill, Leiden 2014) and articles in the* Journal of Popular Film and Television *and* Framework. *Current research includes the collaboration between the Dutch filmmaker Joris Ivens and American writers Ernest Hemmingway, John Dos Passos and Archibald MacLeish that produced the pro-republican propaganda film* The Spanish Earth *(1937).*

Plate 1: The Annunciation with Saint Emidius [1484] 207×146cm. Carlo Crivelli {Tempera with some oil on panel, later transferred to canvas. London, National Gallery}

An Unusual Announcement
'The Annunciation with Saint Emidius' by Carlo Crivelli

DESMOND WINTERBONE*

24 September 2019

1. Introduction

You are immediately struck by Crivelli's *Annunciation* (Plate 1): the viewer stands at ground level on the edge of the picture plane, a quarter of the distance from the left-hand side. This has a slightly disconcerting effect, with the viewer's eyes being drawn towards the end of a street defined by the steep perspective of buildings on either side towards a classical Romanesque arch and then on to a wall with trees beyond – the location of the vanishing point. Our eyes are drawn to the two men kneeling close to each other in rich attire: the one on the left is the Archangel Gabriel and the other, holding an elaborate model of a town, we will identify as Saint Emidius. As we look more carefully, we can see more people inhabiting the scene – who are these, and why are they important? Then we notice on the right of the picture, through the ornate doorway of a rich two-storey villa, the woman kneeling reading at a *prie Dieu*: this is the Virgin Mary. Our eyes are drawn to the rich pilasters and capitals of the door frame, then the terracotta frieze that runs along both sides of the building at first floor level; moving upwards our eyes see the building has an expensively decorated loggia on the first floor, which the artist has embellished, flamboyantly, with an Anatolian carpet and a peacock. After feasting on this detail, we notice a ray of light emanating from a cloud and miraculously passing through a small hole in the wall of the house to alight on the head of the Virgin – above which the Holy Ghost flutters in its embodiment as a dove.

At first sight you are so overwhelmed by the layout, detail, and brilliance of colour that you do not realise it is an Annunciation until you read the label. This Annunciation is unlike most others and requires careful examination to decipher its contents. First, it has a 'portrait' layout, whereas its predecessors have usually been in 'landscape': this format was dictated by the proposed location. However, Crivelli has used this orientation to good effect in developing an 'unusual announcement' with geometrical intricacies, deep perspective, spectacular architecture and a depth of symbolism – and it is also unlike most of Crivelli's other work. This paper will analyse the picture and put it into context with similar work of the period.

Before doing this, it is necessary to consider the background of both the artist and its commissioning. Carlo Crivelli (1430s-1494?) was born in Venice

* based on a project submitted to the Open University, 2007

(Dunkerton *et al*[1], Zampetti[2]) to a Venetian painter. He was sentenced to prison there for adultery with a sailor's wife. By 1465 he had moved to Zara, Dalmatia; he had definitely moved back to Ascoli Piceno in the Italian Marches by 1468 (Zampetti[2], p 15). Crivelli obviously valued his Venetian background and signed the *Annunciation* with

'OPUS·CARO/LI·CRIVELLI·/VENETI''1486'

on the pilasters of the doors. He was obviously aware of the rules of perspective that had been formulated around this time by Alberti[3], and Piero della Francesca[4] [original date c1450]. A fuller biography of Carlo Crivelli is given in Appendix 1. Turning to the commissioning of the painting, this was obviously completed in 1486. The painting commemorates the Papal Bull that was awarded to the town of Ascoli, mistakenly thought to be on 25th March 1482 – the Feast of the Annunciation, and the epigraphic legend *Libertas Ecclesiastica* (Liberty under the Church) celebrates this occasion.

2. Geometrical analysis

Segment 3 Papal Bull brought to Ascoli by papal messenger	*Segment 4* Symbols and demonstration of artistic virtuosity
Segment 2 AngelGabriel and Saint Emidius in Street	*Segment 1* Virgin Mary reading in house

Figure 1: Basic layout of The Annunciation

One of the most dominant features of *The Annunciation* is the unusual geometrical layout. Plate 2 shows the main geometric structures that can be ascertained from an analysis of the painting. The first significant feature of The Annunciation is that it can be divided vertically in half, along the wall of the Virgin's house. Having done this Crivelli then places his vanishing point for perspective on the vertical centreline of the left half of the painting – making the picture asymmetrical and drawing the eye of the viewer to the left and away from the Virgin Mary. This approach is uncommon, but Crivelli might have seen a similar layout in Filippo Lippi's Annunciation (1467-69) in Spoleto Cathedral (about 80km from Ascoli), with which his painting has other architectural similarities (Plate 3). It is also possible to divide the painting horizontally to make four parts, as shown in Figure 1, each containing a separate vignette of the story: the horizontal dividing line is located at the top of the pilasters of the Virgin's door.

Plate 2: Geometrical analysis of Plate 1

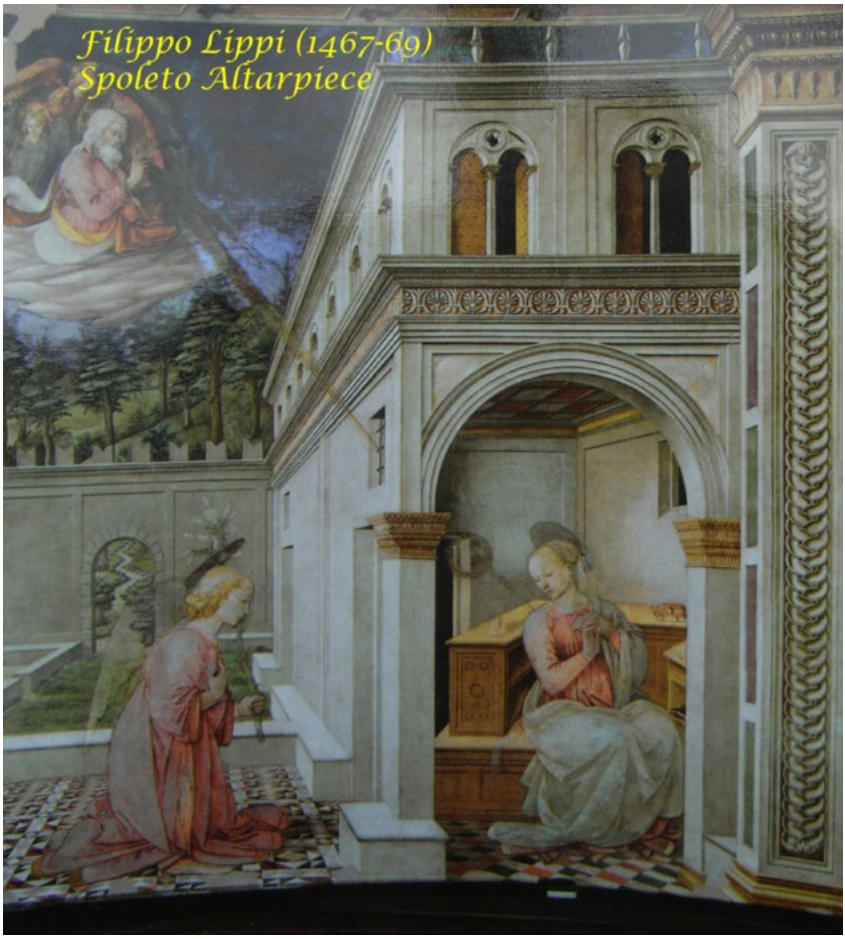


Plate 3: The Annunciation. [1467-69] Fra Filippo Lippi
Fresco, Spoleto Duomo.{Art Resource ART12794. www.artres.com. *Accessed 01/09/2007}*

3. Comparison with Tuscan Annunciations

Many people will be familiar with typical Annunciations from the fourteenth- and fifteenth-centuries: these usually depict Gabriel entering the picture space from the left-side, and announcing the miracle birth to Mary, who is often kneeling or sitting on the right-side: the picture usually contains only two significant 'actors'. The earliest depictions of Annunciations go back to fourteenth-century Tuscany, and are exemplified by those of Duccio (Plate 4) and Giotto[a, b] (Scrovegni Chapel).

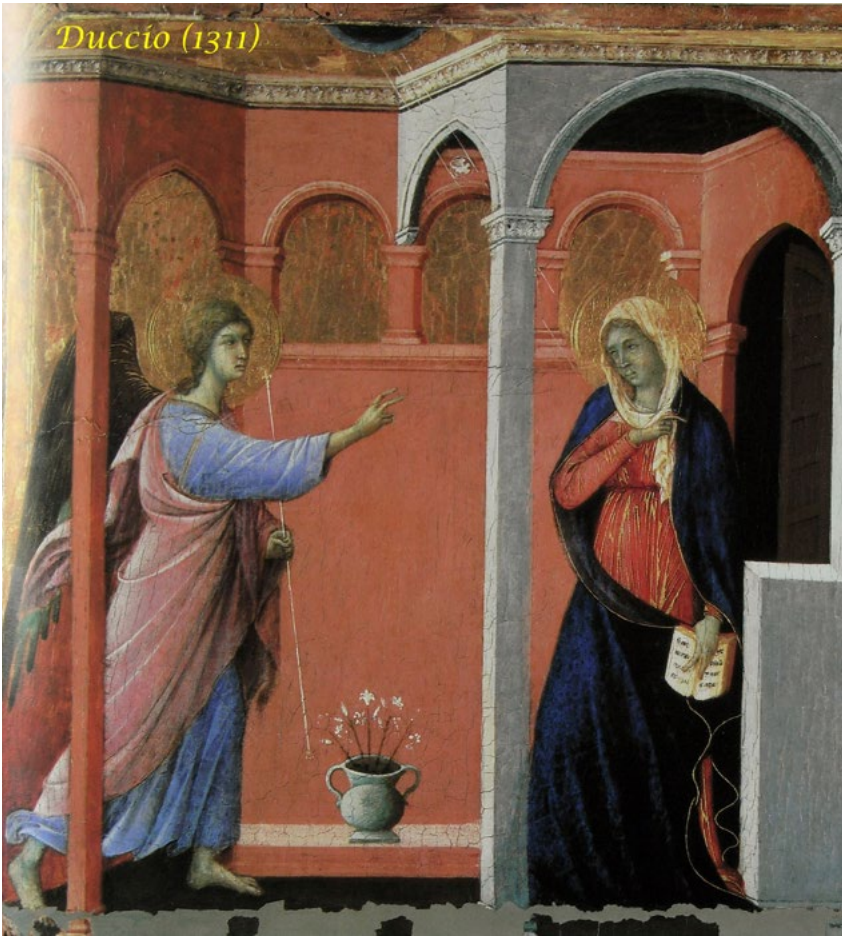


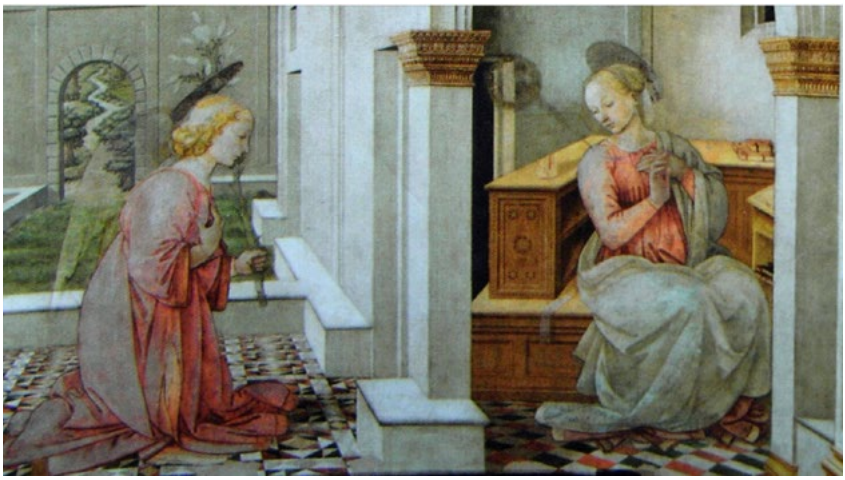
Plate 4: The Annunciation, panel from Maesta. [1311] Duccio Buoninsegna
Tempera on panel, Museo dell' Opera del Duomo, Siena.

The architecture is relatively simple so as to not detract from the message, and this arrangement is adopted in Fra Angelico's fresco in San Marco, Florence (Plate 5, overleaf). The International Gothic style gave rise to *The Annunciation* by Simone Martini and Lippo Memmi[c], with its extensive gilding typical of Trecento and Byzantine art: this painting also introduced Gabriel's greeting to the Virgin -'*Ave Maria Plena Gratia*'. The Gothic style was used by Gentile da Fabriano in his '*Adoration of the Magi*' and would have been known to Crivelli. Typical examples of this format are discussed in Spencer[6]. It is possible to compare both Crivelli's and Lippi's paintings with these others by cropping

Plate 5: The Annunciation. [1440–41] Fresco from monk's cell, San Marco, Florence {Toman [2005], p250}

both paintings close to the top of the doorway (see Plate 6). Lippi showed how to fill a portrait space by extending the architecture upwards, and Crivelli took advantage of this approach to introduce even more detail, and to develop parallel stories (see section 6).

Spencer[6] points out that the Annunciation is one of the most easily understood ways of demonstrating the theoretical concept of the Incarnation of the Word, and it plays a major role in Christian iconography: it also depicts



(a) Truncated copy of Spoleto *Annunciation* by Fra Filippo Lippi

(b) Truncated version of *The Annunication* by Crivelli

Plate 6: Comparison of cropped versions of Plates 1 and 3

Mary as the intercessor for humanity. The Annunciation achieved a similar importance in many parts of Italy to the images of the Madonna and Child that dominated Byzantine iconography. Spencer[6], who concentrates on the iconography of Annunciations, takes many of his examples from Tuscany, some which are Fra Angelico (Plates 7 and 8) and Fra Filippo Lippi[a, b]. I have also added other important Annunciations of this region from the period Baldovinetti, Leonardo, Botticelli and Botticelli (plate 9).

Plate 7: The Annunciation [1435–45] Fra Angelico
Gesù church, Cortona {Toman [2005], p251}

Spencer[6] points out that initially painters adopted Duccio's approach (Plate 4) of a canopy to separate the actors in the drama (see Spencer examples by Veneziano, and Gozzoli), but later the canopy was extended in Florence to include both the Virgin and Gabriel in the same space. Even so, there are variations on this theme, with both participants obviously occupying the same space (e.g. Leonardo[g], Botticelli (Plate 9)), and being separated from each other in the same building by pillars (e.g. Fra Angelico (Plates 7, 8), Filippo Lippi[d],

Plate 8:The Annunciation [1435–45] Fra Angelico
convent of San Marco, Florence {Bietoletti, S et al [2005], p254}

and Botticelli[h]). By now most Florentine Annunciations show the influence of the new aesthetic outlined by Alberti[3], which required that art should inhabit a rational picture space based on perspective constructions, as is evident from the pictures just discussed. Such an approach made the art more tangible to the observers, and possibly helped to disseminate the message. However, this approach also reduced its devotional impact compared to iconographic images – a point taken up by Savonarola and the later iconoclasts of the Reformation.

While there are significant differences between the paintings chosen by Spencer and me, there are also common features. In general Gabriel enters from the left and gives his message to the Virgin on the right: this follows the convention of reading from left to right. In many Annunciations the Virgin is either seated or kneeling, and in some she is reading from Isaiah (7:14) *"Ecco Virgo concipiet et pariet filium, et vocabitur nomen eius Emmanuel"* ("Behold a Virgin shall conceive and bear a son and his name shall be Emmanuel"), which predicts the event. Symbolism was introduced to the subject by Duccio, who included lilies, the white being the symbol of purity and these are retained in many of the later depictions. The genre developed to include the enclosed garden, *hortus conclusus*, representing the Virgin's womb, which became a major feature of most of the later Florentine Annunciations.

Plate 9:The Annunciation [1489-90] Sandro Botticelli
Uffizi Gallery, Florence {Bietoletti, S et al [2005], p298-9}

This varied from the small walled gardens that feature in Spencer's examples to the open spaces chosen by Leonardo da Vinci[g] and Botticelli[h],(Plate 9): the latter show the influence of Northern artists in introducing realistic landscapes. A number of the Annunciations contain more than the major characters. Fra Angelico, uniquely, includes Adam and Eve in the background of his *Cortona Annunciation* (Plate 7) – indicating that Mary's miraculous conception would, through the sacrifice of her son, redeem the world of its 'original sin'; he also includes Saint Peter Martyr in the painting for the 'cell' in San Marco (Plate 5).

I have shown how Florentine Annunciations developed from the early trecento depictions, but these do not really throw any light on Crivelli's painting. Alberti's influence freed the Annunciation from an almost iconographic, devotional portrayal into a realistic narrative space, but still it occurred in the privacy of the home – like all conceptions should, miraculous or otherwise!

How did Crivelli come to create his own special depiction? We need to look to the art that was being developed in the Marches see how it might come about and this is considered in section 4.

4. Marchigian 'Annunciations'

Crivelli's work is very different from the Florentine Annunciations in Section 3: but was it influenced by contemporary painting in the Marches?Zampetti[7] has a number of examples of such paintings and two of these are included as Plates 10 and 11; there is also Lippi's Spoleto fresco (Plate 3).

Plate 10:The Annunciation [c1447] Fra Carnevale
National Gallery of Art, Washington {Zampetti [1971], Figure 73}

The early Annunciation by Fra Carnevale[k] ([c1448], Plate 10) has similarities in layout to Lippi's Spoleto painting with carefully depicted perspective leading the eyes to the doorway of the *hortus conclusus*. However, here, both the main characters occupy the same picture space with the Virgin in the garden with Gabriel. The Annunciation by Gerolamo di Giovanni[l] (between 1449 and 1473) has many similarities with the work by Carnevale (Plate 10), with the street scene diminishing in the distance using the rules of perspective he had

learned from Piero della Francesca. Gerolamo also includes portraits of two donors looking on from the left, and praying to Mary for her intercession. Zampetti[7] (p194) comments that some Marchigan painters had worked in Padua with Mantegna and Squarcione, and that some of works had been attributed to Schiavone: Crivelli was close to Schiavone when both were in Zara. The last Annunciation chosen, Plate 11[m], is by Giovanni Santi, the father of Raphael. In Plate 11[m], Mary is depicted under a loggia with Gabriel outside – a traditional approach; but Santi's inclusion of landscape in the background is more reminiscent of Northern art than the Italian of this period. He has also introduced God, holding a sphere, in the upper left corner and a cherub carrying a cross, predicting Christ's death, descending on the Virgin.

Plate 11:The Annunciation [c1490] Giovanni Santi
Galleria Nazionale, Urbino {Zampetti [1971], Figure 170}

So, the art developing in the Marches was different from that of the main centres. It was influenced by Piero della Francesca a 'local' painter, but also by Marchigian artists travelling, mainly to Padua, for artistic training. In addition,

the Court at Urbino attracted artists to practise there, and various churches, e.g. Spoleto, could commission the likes of Filippo Lippi. It was into this scenario that Carlo Crivelli came when returning from Dalmatia.

5. Carlo Crivelli and his paintings

The paintings of Carlo Crivelli are discussed in detail in the books by Lightbown[8] and Zampetti[2] , and a review of his portfolio shows his Annunciation is not in character with most of his work, which Piper[9] (p121) states is a 'legacy from Mantegna; so is his accomplished illusionistic decoration – his delight in marbled surfaces and shining objects'. Toman[10] (pp361-3) compares Crivelli to Carpaccio (1455-1526), both of whom visited Dalmatia, and says they "remained true to the Quattrocento, without any significant shift towards modernity". He comments on their "Gothic pleasure in narrative, their multi-faceted compositional style … along with their perfectionism and a pleasure in the handling of texture", and refers to Crivelli's 'almost Byzantine-Venetian traditionalism, which brings splendour and a wealth of detail into his pictures, displays revivalist features – a kind of neo-Gothic ...'. Crivelli's work can be sub-divided into a number of distinct groups: his Madonnas[n, o]; his polyptych altarpieces[p, q]; and his Entombments or Pietas[r,s]. Two of Crivelli's most significant works are the polyptychs he produced for Massa Fermana[p] and San Domenico[q]. The first one appears to be quite archaic in style and is reminiscent of altarpieces produced in Tuscany, particularly Siena, in the Trecento. The other is in the International Gothic style, and again is anachronistic – more like Gentile da Fabriano than a Quattrocento painting. A general feature of these paintings is Crivelli's meticulous attention to detail; the beauty of the Virgin, the fabrics of the garments, the way in which he defines the picture space and then protrudes beyond it, his care with landscape backgrounds.

Many of Crivelli's panels for altarpieces have been mounted separately and highlight his Gothic style of depicting the saints (see Dunkerton[1], Langmuir[12]). These are meticulously shown in great detail, often with identifying features, and while they impress they are static and lifeless. Crivelli did not really adopt Renaissance developments for many of his works.

6. The Annunciation with Saint Emidius

The wide-ranging discussion given above has not really solved the mystery of Crivelli's *The Annunciation with Saint Emidius*, which looks out of tune with his other work, and that of other artists. Obviously the shape was dictated by the location, and the composition by the commissioners: was Crivelli told that the narrative of the Papal Bull should be included with the major characters – presumably so. If this was the case, Crivelli has tackled the challenge in an imaginative and resourceful manner.

Dunkerton[1], Lightbown[8] (pp323 *et seq*) and Zampetti[2] discuss the history and symbolism of this painting in more detail than possible here; I have abstracted the main details from their books. As I showed in Plate 2, what makes this painting appear unusual is the portrait layout; Crivelli has used

the extra freedom above the main event to emphasise the importance of this Annunciation and the date of 23rd February 1482 to Ascoli Piceno. Comparison of the bottom half of this painting (Figure 1, segments 1 and 2) with vignettes from the Camerino altarpiece shows that Crivelli built on the latter (Plates 12 & 13). He has embellished the architecture of the Virgin's house both internally and externally, but retained the general details. Segment 1 depicts the Virgin's house, which although it appears to be a palazzo with its steep perspective is in reality only an ornate two storey town house – similar approaches were used by Carnevale (Plate 10), Giovanni Santi (Plate 11) and Lippi (Plate 3).

Plate 12: Gabriel and Virgin [1482] Carlo Crivelli
from polyptych for San Domenico di Camerino (now in Frankfurt am Main)
{Zampetti Plates 64 & 65; Lightbown Plates 119 & 120}

Lightbown suggests the open doorway is a symbol representing the *Porta* or *Janua Coeli* (Doorway of Heaven), which can be entered through the intercession of the Virgin. The pilasters of the door are carved from *pietra serena*, and are similar to Ghirlandaio's in the Tournabuoni Chapel (1486-90) (Bietoletti[13], pp276-7) suggesting some transference of influence into the region. Crivelli retained the large grated window with the myrtle bush on the window-ledge, but where he used this to admit the Holy Spirit in Camerino he has opened a miraculous aperture in Ascoli – Lightbown argues this may be because the Franciscans did not believe in human intervention in Mary's insemination. He has similarly 'improved' his depiction of Gabriel and his architectural setting between the two paintings. So the Ascoli painting had a direct antecedent that might have been defined as a model by the patrons.

The main characters in achieving *Libertas Ecclesiastica* are introduced in Appendix 2, and these have been labelled in Plate 14. Crivelli used symbols and devices in many of his early works, but did not combine anything like as many as in The Annunciation – this picture tells a number of stories. Just focussing on Plate 14, this painting is unique because of the way it contains a third person, Saint Emidius, in equal status to the other actors. Emidius, the patron saint of Ascoli is holding a model of the town, and asking Gabriel's protection for it. Gabriel stands slightly before Emidius, indicating his superior rank, and holds three Madonna lilies that represent Mary as a virgin before, during and after the conception of Christ.

Three men and a boy stand on the stairs to the left of Segment 2 (Figure 1): two of the men are Observant Franciscans who were instrumental in building the church of the Annunziata (the prime commissioner, Fra Bernardino Ferretti, had already used Crivelli to paint *The Vision of the Beato Gabriele Ferretti* [c1487-8]), and the third is possibly a rich donor. The boy, probably the son of the donor, has seen the ray of light entering Mary's house – again a unique feature of this painting. He is not the only 'observer', because Andre a Matteo Acquaviva, standing under the arch, is shading his eyes from the light. Lightbown suggests the other man in Segment 2 is Persante Angelucci di Andrea, the Master of the Mint, who would have had to find the funds for the church.

Segment 3 contains a lot of additional information: the doves returning to the cote indicate it is sunset, the traditional time of the Annunciation; and God, in the form of a cloud surrounded by cherubs, sends down the Holy Spirit in the form of another dove to Mary's head. While Mary receives her 'message' in the bottom right of the painting, a man (probably Antonio Benincasa) receives another announcement – brought by a dove – in the top left: this is the Papal Bull announcing *Libertas Ecclestiastica*. The bridge on which they stand could symbolise the way through which God's message will leave the *hortus conclusus* into the world, although this is a much more public conception.

Crivelli has used Segment 4 to show his virtuosity and learning: he has brought together many Christian symbols to complete his picture. The peacock and the Anatolian carpet (note there is also one on the bridge) are dazzling displays of artistic skill: Crivelli had already used the latter in the Camerino altarpiece. The peacock is symbolic of immortality because it was thought its flesh did not decay: Lightbown[8] suggests that its location over the frieze depicting the death of Satan indicates the triumph of Christ over sin. The goldfinch in the cage presages, based on the bird's diet of thistles and thorny plants, Christ's death wearing a crown of thorns; the dianthus was a symbol of marriage, and symbolises Mary's consent to become the 'Spouse of God and Mother of Christ'; and the bay myrtle has been interpreted, from Zacchariah (1:8) as a symbol for the conversion of the Gentiles. Crivelli has extended his symbols beyond the picture space with the cucumber and apple in Segment 2; these are reminiscent of his technique in earlier paintings. The cucumber was apparently (Lightbown[1] , p336) associated with Jonah, who after three days in

Plate 13: Comparison of Gabriel and Virgin from Camerino altarpiece (Plate 12) and The Annunciation with Saint Emidius (Plate 1)

(top: the Polyptych at S. Domenico, Camerino
bottom: The Annunciation at Ascoli Piceno)

Plate 14: The Annunciation with Saint Emidius (Plate 1) with the main characters and symbols labelled

the belly of the whale 'came back to life' – a prediction of the Resurrection: the apple symbolises the fall from grace, and its presence here indicates Mary's role in redeeming Original Sin.

The final part of the painting is outside the picture space, and is the epigraphic *Libertas Ecclesiastica*, with the attendant coats of arms. These arms commemorate the main collaborators in the building of the Church. On the dexter, dominant, side are the Caffarelli arms, indicating his major role in the negotiations: in the centre are the arms of Pope Innocent VIII, while on the sinister side are those of Ascoli. This picture is more than a devotional representation of the Annunciation: it is a political commemoration of the time Ascoli Piceno achieved a form of independence, and also protection under the church. In addition, it was used to adorn the new church of the Annunziata built by the city for the Observant Franciscans.

7. Conclusions

I hope my initial reaction to Crivelli's painting was a reasonable one – it is 'an unusual announcement' and worthy of further consideration. The books by Lightbown[8] and Zampetti[2,7] have opened up the whole world of Crivelli and Marchigian painting, but this is still relatively inaccessible to the average viewer. Many innovators came out of the regions bordering on the Adriatic coast, including Piero and Raphael, but still Renaissance art seems to revolve around Florence, Rome and Venice without giving credit for the interactions that enabled its full development. Was this because the Tuscans had better 'art historians' and writers in the form of Vasari and Ghiberti, who have dominated our judgement and diminished the contributions of others including the Northern artists – or possibly Marchigian art was different and inferior?

Crivelli's *The Annunciation with Saint Emidius* will continue to make an impression on all visitors to the National Gallery: they will be amazed by the detail, activity and sheer virtuosity of the painting, probably without realising half of its significance or wondering on its provenance.

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Links to additional works

a The Angel Gabriel Sent by God, Scenes from the life of the Virgin: Annunciation, Giotto, Scrovegni Chapel, Padua

b The Virgin Mary receiving Gabriel's message, Scenes from the life of the Virgin: Annunciation, Giotto, Scrovegni Chapel, Padua

c The Annunciation with two saints. [1333] Simone Martini and Lippo Memmi, originally in Siena Cathedral, now in Uffizi Gallery, Florence

d The (Cestello) Annunciation [c1440] Fra Filippo Lippi, tempera on panel for San Lorenzo, Florence. Private collection

f The Annunciation [c1457] Alesso Baldovinetti, tempera on panel, now in Uffizi Gallery, Florence

g The Annunciation [1473-75] Leonardo da Vinci, oil and tempera on panel, originally in San Bartolemo, Monte Oliveto, now in Uffizi Gallery, Florence

h The Annunciation [c1481] Sandro Botticelli, fresco originally in Santa Maria della Scala, Florence, now Uffizi Gallery, Florence

k The Annunciation [c1447] Fra Carnevale, National Gallery of Art, Washington

l The Annunciation [1449-73) Gerolamo di Giovanni

m The Annunciation [c1490] Giovanni Santi, Galleria Nazionale, Urbino

n Madonna and Child [c1480] Carlo Crivelli, Tempera on panel, The Met Fifth Avenue, NY

o Madonna and child [c 1460] Carlo Crivelli, Tempera on panel, Verona

p Polyptych Massa Fermana from San Silvestro [1468] Carlo Crivelli, tempera and gold on panel

q Polyptych for Altar of San Domenico in Ascoli [1476] Carlo Crivelli, tempera on wood

r Pieta [?] Carlo Crivelli, tempera on wood, Vatican Museum, Rome

s Pieta [1493] Carlo Crivelli, tempera on wood, Brera, Milan

APPENDICES

Appendix 1: Background to artist

Carlo Crivelli (1430s-1494?) was born in Venice (Dunkerton *et al* [1991], Zampetti [1961]) to a Venetian painter. He was sentenced to prison there for adultery with a sailor's wife. By 1465 he had moved to Zara, Dalmatia, which had been sold to Venice in 1409; but he then moved back to the Italian Marches by 1468, and later settled in Ascoli Piceno by 1478, when he is described as an inhabitant of the town. Crivelli obviously valued his Venetian background and signed the *Annunciation* with

'OPUS·CARO/LI·CRIVELLI·/VENETI''1486'

on the pilasters of the doors. Zampetti (1961, 1971) states that while it is difficult to trace direct influences on Crivelli, he would have been aware of the developments being introduced into Venetian art through his early life there. Crivelli is known to have attended Squarcione's workshop in Padua, and might have been a fellow pupil of the Dalmatian painter Schiavone, with whom he spent some time in Dalmatia. It is also known that Mantegna had connections to the Squarcione workshop, and hence Crivelli would have been aware of his contribution to fifteenth-century art: he would have indirectly have seen the influence of Jacopo Bellini. He was obviously aware of the rules of perspective that had been formulated around this time by Alberti [1435], and Piero della Francesca [c1450].

Crivelli did not do much of his work in the major centres of artistic activity, and Zampetti ([1971], p175) states that there are only a few paintings from his pre-Marchigian period (*Madonnas* [Verona Museum, San Diego Museum]). However, he did not work in isolation or without the influence of others because there was a significant foundation of painting in the Marches and their environs. Zampetti ([1971], preface) refers to the "great variety of artistic expression to be found in the Marches … determined by the small busy towns scattered throughout the hinterland". The towns of Camerino, Matelica, Fabriano and Pergola, in all of which Crivelli worked, have lent their names to famous works

or artists of the period. Perhaps the most famous is Fabriano, which produced a 'school' of significant painters including Gentile da Fabriano (c.1385-1423), renowned for his *Adoration of the Magi* (1423) (Bietioletti [2005], p225) – an excellent example of the late (International) Gothic style of painting that was being superseded by the Renaissance style. The district also contained the town of Urbino, which was the base of the Montefeltro family that was a great sponsor of the arts. Richardson ([2007], p257) describes how many artists were attracted to this Court, and would have learned much from the work of Piero della Francesco (1415/20-1492), born in Borgo Sansepolcro , who worked there and also developed his treatise on perspective. Urbino and the Marches might not have been at the centre of the Renaissance but they were a meeting point for artists from many areas, and hence Crivelli would not have worked in isolation.

Appendix 2: Persons in painting

Person	**Role in Ascoli or *Annunciation***
Saint Emidius	Patron saint of Ascoli Piceno
Prospero Caffarelli	Bishop of Ascoli
Fra Bernardino Ferretti	Observant Franciscan, *guardiano* of convent in 1486
Antonio di Grazoso Benincasa	*Cancelliere* of Ascoli: effectively the Town Clerk, the highest administrative position
Piersante Angelucci di Andrea	Master of the Ascoli mint
Andrea Matteo Acquaviva	Duke of Atri (from 1481), and richest man in neighbourhood of Ascoli
Pope Innocent VIII	Pope who renewed the original *Libertas Ecclesiastica* in 1486:Successor to Pope Sixtus IV.

Desmond Winterbone was born and educated in Tenby, Dyfed. He was a student apprentice in mechanical engineering and obtained a BSc. This was followed by a PhD from Bath University. He joined the Mechanical Engineering Department in UMIST, where he became a Professor and later a Pro-Vice Chancellor. Elected to Fellowship of Royal Academy of Engineering in 1989. He was invited to take visiting positions in China (World Bank), Japan (Mombusho) and New Zealand, and awarded a DSc (h.c.) from the University of Ghent (Belgium). He took early retirement in 2002, soon became bored, and took a Humanities degree at the OU: this developed his interest in History of Art.

Crime and Punishment – why do we punish offenders?

HIS HONOUR JUDGE DAVID STOCKDALE QC

24 October 2019

The figure below is of the waterfront at Mitylene, the beautiful port on the Greek island of Lesbos. In 427 BC things happened there which may have a familiar ring to them. Mitylene was then a city state and a member of the Delian Confederacy, a strategic and economic union of all the Eastern Mediterranean city states, centred on Athens. Having defeated the Persians about 50 years earlier, Athens was a superpower in those days, holding together this league of states, whose main purpose was to fend off any lingering Persian threat and whose secondary purpose was to keep at bay Athens' noisy neighbours the Spartans.

Figure 1. The waterfront at Mitylene

In 427 BC the good people of Mitylene held a referendum and decided they no longer wanted to remain a member of the Confederacy and opted to leave. Does this strike a chord? Unhappily for the Mityleneans, their decision to opt for a no-deal exit went down badly in Athens. Suspecting (correctly) that the Spartans were behind it all, the Athenian assembly decided not to impose a financial penalty on Mitylene but to send a ship with instructions that every single male citizen of Mitylene was to be executed, remainer or not and every woman and child sold into slavery. Thankfully such a one-sided arrangement was not a deal anyone tried to sell to the British Parliament in 2019.

What, you may well ask, has all this to do with theories of punishment? Actually quite a lot because the decision of the Athenian assembly to execute the men and sell the women and children into slavery set in motion the Mitylenean Debate, which has kept scholars of ancient history and politics, not to mention punishment theorists, in work for generations. The great historian Thucydides [c 460 - 400 BC] was present when the Assembly voted to kill the Mityleneans. He was also present the next day, when the Assembly reconvened, had second thoughts and in an unprecedented move, reversed its decision. And it was in that debate, the Mitylenean Debate, recorded by Thucydides, that we find one of the earliest examples in recorded history of the application of fundamental principles of punishment.. The Mitylenean Debate was about power, the democratic process and justice. It was in that debate that Cleon, the famous demagogue, argued that the decision to execute all the male Mityleneans was necessary and correct. He said it was what they deserved. He also said that to waver now and to reverse the decision would be to send out a message that Athens was soft on 'Brexiteers' with the result that others would soon join the revolt. The Mityleneans needed to to be taught a lesson and others, thinking to break away, needed to be deterred. Speaking against the motion was Diodotus, who said that if you kill off the males, including the innocent, you will actually encourage further revolts, because other offenders will feel they have nothing to lose by continuing their revolt and will fight to the end. It wasn't a matter of pity or compassion or justice; it was pure pragmatism. Better to spare the Mityleneans and keep their annual contributions coming in to the central treasury (in their case it was paid in ships). Thucydides recorded the Mitylenean Debate word for word and it contains a classic working example of the mixed application of deterrent and retributivist theories of punishment. According to Diodotus:

> The question before us as sensible men is not their guilt, but our interests. Though I prove them ever so guilty, I shall not, therefore, advise their death unless it be expedient …
>
> The question is not justice, but how to make the Mityleneans useful to Athens...
>
> It is probable that in early times the penalties for the greatest offences were less severe, and that, as these were disregarded, the penalty of death has been by degrees in most cases arrived at, which is itself disregarded in like manner. Either then some means of terror more terrible than this must be discovered, or it must be owned that this restraint is useless.

In the event the more lenient option prevailed. Unfortunately, the ship carrying the wholesale death warrant had already departed the day before so another ship was sent with the fresh instruction and, with rowers working in shifts day and night and fed and watered as they rowed, it arrived just in time to stop the bloodshed. Not all of it: a thousand of the ringleaders were rounded up and executed, to be on the safe side.

The Greeks were not unfamiliar with punishment theory. In his dialogue Protagoras, Plato [c 428 - 348 BC] was writing principally about virtue and whether it was acquired by nature or by chance or whether it could be taught. He said:

> No one punishes a wrongdoer in consideration of the simple fact that he has done wrong, unless one is exercising the mindless vindictiveness of a beast. Reasonable punishment is not vengeance for a past wrong - for one cannot undo what has been done - but is undertaken with a view to the future, to deter both the wrongdoer and whoever sees him being punished from repeating the crime.

In saying this, Plato, like Thucydides, captured the retributivist and deterrent theories in a nutshell. It is sobering to recall that he was writing in the 4th century BC. These words could have been written yesterday.

My purpose in this article is to look at the why and the how of modern sentencing of criminal offenders: to look at why judges pass sentences on offenders and how they go about it. But it is not possible - and certainly would not be right - to look at present day sentencing without first asking some old questions and considering some well-worn principles of punishment theory. Why do we punish people? Who should be punished? What punishment should they receive and what is its purpose? It is time to think about the those two well-known, apparently contradictory, justifications of punishment: Utilitarianism and Retributivism. I do not have space here to do justice to the centuries of scholarship that have been devoted to these philosophical subjects but it is necessary briefly to look at some basic principles.

Utilitarianism

Utilitarianism is a cluster of inter-related theories developed over some 200 years, originating amongst William Paley [1743- 1805] and others and perhaps most famously attributed to Jeremy Bentham [1748 - 1832] and John Stuart Mill [1806 - 1873].

Figure 2. William Paley, Jeremy Bentham and John Stuart Mill.

In short form, utilitarianism is an ethical theory that promotes happiness and wellbeing - or utility - for the majority of citizens. Bentham described utility as:

> that property in any object, whereby it tends to produce benefit, advantage, pleasure, good happiness…. or to prevent the happening of mischief, pain, evil or unhappiness to the party whose interest is considered.

Utility has also been called 'the greatest happiness of the greatest number.'

When it comes to punishment, utilitarian theories generally look forward to the future consequences of punishment (as Plato did) while retributive theories look back. Utilitarian justice requires the maximisation of welfare (happiness) across all relevant individuals. Punishment is unpleasant and intrinsically 'bad' but it is justified by maintaining the balance of pleasure over pain by discouraging pain-producing behaviour. Individuals are punished for the good (overall happiness) of society, and so punishment, it is said, serves three principal purposes: deterrence, rehabilitation and security/incapacitation. One might add a fourth: reparation or restorative justice. Attractive though this may seem, there are some snags:

(i) Criminals are not in fact deterred. As the rate of recidivism shows, they offend, re-offend and re-offend again - the point made over 2500 years ago by Diodotus in the Mitylenean Debate; the criminal in the dock was not deterred; it is better to tackle the causes of crime rather than crime itself - or to improve detection rates; it is often the prospect of getting caught that deters, not the threat of punishment.

(ii) Why confine punishment to the guilty? Why not punish the innocent - for the sake of greater happiness? That would be utilitarianism in its purest form. It does not matter whether the person punished has or has not committed the offence, as long as everyone believes he has. For the greater benefit of all, it is legitimate to punish the innocent. (Cleon said this in the Mitylenean Debate.)

(iii) How much should we punish? The strict utilitarian would allow severe penalties for minor offences. Why not cut off the arms of all those who commit parking offences? Soon everyone would obey the parking laws, for the greater happiness of all those parking their cars. Why not execute a few shoplifters on live television? Or burglars, for the greater good of all householders? Bentham actually tried to meet this argument by devising a calculus in which the punishment inflicted was to be just enough to counterbalance the temptation to commit the offence but no more. And yet, we would say, there should be a moral fit between the quantum of punishment and the offence. If that is right, we cannot accept utilitarianism in an undiluted form.

(iv) Finally, it is said that utilitarianism is simply unjust. Where in utilitarianism is there reference to guilt, to moral accountability, to blameworthiness? Do we not feel instinctively that these factors ought to be ingredients of punitive justice?

Retributivism

Retributivism is the theory that there is no need to look forward to the consequences of punishment; we need only look back. Deterrence and reform of the offender are irrelevant. Look back at the offence and punish the offender for the act, regardless of the outcome of the punishment. The criminal deserves to be punished and those who are guilty of crime deserve appropriate punishment. It is a theory which meets head-on the objection that punishment must reflect guilt and must reflect blameworthiness. This is an eye for an eye, a tooth for a tooth response and it is a theory with a long history in many civilisations.

Figure 3. Immanuel Kant (1724 - 1804)

Yet retributivism has had a bad press - the very term connotes retaliation and revenge and to some it is vindictive, The needs of the offender are ignored as are the needs of society. Indeed, in its purest form (as advanced for example by Immanuel Kant), retributivism requires that wrongdoing be punished whether or not criminality is reduced and - by extension - even if criminality is thereby increased. Justice plays no part in the process. There is simply a pricing system and if one commits a crime, one pays the price.

It is necessary to keep these theories in mind as we look at what actually happens when a judge sentences an offender. To the uninitiated, it might seem that when a person is found guilty by a jury or pleads guilty to an offence, the judge considers the seriousness of the offence, puts a finger in the air and comes up with a figure, measured in years. If the opinions of some tabloid newspapers are any guide, what judges do then is halve that figure, then halve it again (and

possibly yet again) and pass a sentence that is ludicrously low and is roundly condemned by everyone. The uninitiated might also think that the law of the land has not troubled itself with philosophical questions about why we punish offenders or with practical questions about how much punishment is to be inflicted: that it is all left up to the judges. On both counts, the uninitiated would be wrong.

All the questions we have raised so far have been debated and legislated upon by Parliament. In the Criminal Justice Act 2003, a mighty statute governing a whole range of aspects of criminal justice, Parliament asked itself why we punish offenders and the answers it came up with are of interest. By section 142 of the Act:

> **Purposes of sentencing**
>
> Any court dealing with an offender in respect of his offence must have regard to the following purposes of sentencing:
>
> (a) the punishment of offenders
> (b) the reduction of crime (including its reduction by deterrence)
> (c) the reform and rehabilitation of offenders
> (d) the protection of the public and
> (e) the making of reparation by offenders to persons affected by their offences.

Note that regard to these purposes is mandatory. But all is not as utilitarian as it seems. The requirement that sentencing should have regard to '(a) the punishment of offenders' has a lot of the appearance of retributivism about it. It looks a little like punishment for its own sake.

Turning to section 143 of CJA 2003:

> **Determining the seriousness of an offence**
>
> In considering the seriousness of any offence, the court must consider the offender's culpability in committing the offence and any harm which the offence caused, was intended to cause or might foreseeably have caused.

Again this is mandatory.

The seriousness of an offence is determined - must be determined - by two criteria: culpability and harm. These are two features of offending on which every sentencing judge will focus attention: (i) culpability (blameworthiness, degree of wickedness or moral wrongdoing) and (ii) harm (extent of injury or damage done). The two words, culpability and harm crop up repeatedly in the Sentencing Guidelines.

By Section 125 of the Coroners and Justice Act 2009:

> Every court must, in sentencing an offender, follow any sentencing guidelines which are relevant to the offender's case…. unless the court is satisfied that it would be contrary to the interests of justice to do so.

Again this is mandatory.

Sentencing Guidelines

Almost every criminal offence has a maximum sentence attached to it, set by statute.

Figure 4. The Scales of Justice

Almost every serious offence also has a Sentencing Guideline attached to it, issued by the Sentencing Council (or by its predecessor, the Sentencing Guidelines Council). It is mandatory that Sentencing Guidelines should be followed. The guidance given to a sentencing judge for any particular offence is carefully drafted.

Here are two examples relating to straightforward offences.

1. Assault occasioning actual bodily harm.

This is a medium level assault offence with a maximum sentence of 5 years' imprisonment. There are three categories of sentence governed by levels of harm and culpability:

Category 1: cases of greater harm and higher culpability,
Category 2: cases of greater harm and lower culpability or lesser harm and higher culpability,
Category 3: cases of lesser harm and lower culpability.

Greater harm is indicated by level of injury, the vulnerability of the victim and whether the assault is sustained or repeated. Higher culpability is indicated by hostility based on sexual orientation or disability or by premeditation, use of a weapon, the intention to commit even greater harm, the deliberate targeting

of the victim, or gang or group activity: lower culpability applies where these features are absent.

The starting point for a sentence is based on the level of these factors and adjustment made depending on the presence of aggravating or mitigating factors some of which are indicated in Table 1.

Aggravating Factors	**Mitigating Factors**
Previous convictions	No previous convictions / good character
Offence on bail	Single blow / isolated incident
Location and/or timing of offence	Remorse
Effects on the victim	Steps to address behaviour
Offence against a public sector worker	Medical condition / mental disorder
Presence of children	Age / immaturity
Degradation of the victim	Others dependent on offender
Victim having to leave home	
Non-compliance with court orders or warnings	
Attempts to conceal evidence	
Influence of alcohol or drugs	
Abuse of power or trust	
Community impact	
Other offences taken into consideration	

Final adjustments are made for other factors including:

Assistance to prosecution
Guilty pleas
Dangerousness / extended sentence
Totality, where multiple offences
Compensation or other orders.

The resulting sentence, based on all these factors, is then passed.

Section 143 of CJA 2003 requires the court to measure seriousness of offending according to culpability and harm and the Sentencing Guidelines follow that requirement to the letter, assisting the judge in measuring the

degrees of culpability and harm. It may appear that the resulting calculation of a sentence is based on sound principle but it will be noticed that concepts such as deterrence and rehabilitation scarcely feature. The grading of the seriousness of an offence (and the fixing of the sentence) by reference to harm done, it may be thought, has some of the features of retributivism about it.

2. Theft

The maximum sentence for theft is 5 years' imprisonment.

Culpability is split into three levels, depending on the offender's role in the enterprise as leader or follower, the level of planning and premeditation, whether there is abuse or breach of trust and whether intimidation is present etc. Harm is measured at four levels, according to the monetary value of goods taken, other harm caused to the victim, fear or distress caused, damage or disruption caused etc. A table, weighing up levels of culpability and harm, takes the judge to a starting point, from which adjustments are made upwards or downwards, depending on aggravating or mitigating factors some of which are included in Table 2.

Aggravating Factors	**Mitigating Factors**
Previous convictions	No previous conviction / good character
Offending on bail	Remorse / reparation
Hostility towards members of minority groups	Steps to address behaviour
Steps to prevent reporting / apprehension	Medical condition / mental disorder
Attempts to conceal evidence	Age / immaturity
Offending over a period	Others dependent on offender
Non-compliance with court orders	
Other offences taken into consideration	
Community impact	

As with the case of assault, adjustments can be made for factors such as assistance to prosecution, guilty pleas, totality where there are multiple offences and compensation or other orders. As with assault, the whole sentencing process is governed by assessment of seriousness, which in turn is governed by assessment of culpability and harm. In the cases of both assault and theft, there is reference to community impact (as an aggravating factor) and to the offender's steps, if any, to address his/her behaviour (as a mitigating factor). Apart from these, there is no reference to deterrence or rehabilitation.

The other Sentencing Guidelines, applying to almost every serious criminal offence (sexual offences, violent offences, drug offences, fraud, - even dangerous dogs) are all very much the same in principle. Judges arrive at sentences by applying formulae set in Guidelines which have statutory force, set by Act of Parliament. They are more or less binding on the sentencing judge and departure from them must be justified by each judge giving reasons. An unjustified departure will result in an appeal and both sides have the right to appeal. Thus the process of sentencing is scientific and not arbitrary.

A shift towards Retributivism

I would respectfully highlight four respects in which it might be said that we have drifted away from well-known utilitarian principles of punishment (deterrence, rehabilitation, reparation) and shifted towards the retributivist.

1. The first is the daily application by judges of Sentencing Guidelines, fixed under statute, which focus on the seriousness of offending alone and which in assessing seriousness confine the judge to narrow tests of culpability and harm.

2. The second lies in a growing mood, stirred in the media and sometimes seized on by politicians, that the sentences passed on criminals are simply too lenient; that criminals are getting off too lightly. It is rarely said that a given sentence was too severe. Everyone shares concerns about, for example, street crime and especially knife crime - not to mention cyber crime, drugs offences, sexual offences or people trafficking and modern slavery. But the present Home Secretary has said that criminals should be made 'literally to feel terror'. The December 2019 Queen's Speech contained promises of yet longer prison sentences and one asks whether there is to be a corresponding commitment to the adequate resourcing of education and rehabilitation of offenders either in prison or after release or by way of community sentence programmes. One asks whether any party has offered to give greater support to the Probation Service. (The recent experiment in privatising the rehabilitation arm of the Probation Service seems to have foundered.) A cynical observer might say that rehabilitation of offenders is not a vote-winner; tougher sentences seem to be. It was Dostoyevsky who said that 'the degree of civilisation in a society can be judged by entering its prisons'.

3. Some offences have been created by Parliament specifically to allow for the imposition of heavier sentences to reflect the harm done alone - irrespective of culpability. The maximum sentence for dangerous driving is 2 years' imprisonment and disqualification. It may seem surprising that driving of the most lethal and dangerous kind e.g. in a police pursuit or road rage incident will not lead to a longer sentence than 2 years. The sentence for causing death by dangerous driving, a separate offence , is a maximum of 14 years. Causing serious injury by dangerous driving, a separate offence created recently (2012), carries a sentence of 5 years. Thus

Parliament has related the length of sentence to the seriousness of the outcome. Such a sliding scale may at first sight seem sensible but how does it reflect the level of dangerousness of the driving or the moral culpability of the driver? Once the driving is of a sufficiently dangerous standard, isn't the outcome, whether that is death, or serious injury, or possibly no injury and no damage at all, just a matter of chance? The point is perhaps most starkly made in the case of causing death by careless driving, an offence created in 2006. Careless driving or driving without due care and attention may take place as a result of just a moment's inadvertence, a failure to judge the speed or position of another vehicle or to allow for the sharpness of a bend or the road conditions. The maximum penalty for careless driving is a fine and an endorsement or disqualification. If the same piece of driving causes death, that is a separate offence, carrying a maximum of 5 years' imprisonment. So one's momentary careless driving may result in a fine on the one hand or 5 years' imprisonment on the other, depending on an outcome which may be a matter of pure chance.

4. My final example of the silent rise of retributivism lies in the voice now given to victims. This is not straightforward. For too long, it is rightly said, the voice of the victim of a crime has been unheard. Historically, for as long as most criminal lawyers can remember, any suggestion that a victim might have a say in sentencing was unthinkable. Prosecutions were brought by the State, not the victim, and the sentence imposed by the State. The victim's role was that of a witness in the case. That has now changed and we have a Victim's Charter, a Code of Practice for Victims of Crime (2013) and a Victim's Commissioner. The rights of victims are now recognised and defended as never before and rightly so. Those victims or others close to them will say 'not before time'. Meanwhile, in sentencing, the court must now have regard to the Victim Personal Statement, a document read to the court by the prosecution or by the victim in person. This is a statement in which the victim describes the effects on him or her of the defendant's offending. It can be moving and at times harrowing to listen to. A victim is not permitted to give his/her opinion on what the sentence should be but the statement is taken into account by the sentencing judge. That is a significant development. (It is not a process designed to bring closure to the victim, although that may be an ancillary benefit.) Also significant is the provision for a victim, much later, to submit a statement to the Parole Board for consideration when the possible release of a prisoner is being considered. The victim may even read out a Personal Statement at an oral hearing of the Parole Board. In this way the victim now has a voice in both the sentencing and eventual release processes.

In these ways, by a combination of public and media pressure and political expediency, by the imposition of heavier sentences based on outcome alone and by the giving of a new voice to the victim of crime, we may be seen as a society to have accepted a subtle shift away from a purely utilitarian rationale of

sentencing towards a retributivist approach. It is not my place - nor is it the place of any judge - to comment on whether this is a good or bad thing. I simply point out that this shift may be happening. As a society, we should never stop asking ourselves why we punish offenders. It is a question as relevant and as important today, no matter how many Sentencing Guidelines may be published, as it was all those years ago when the Athenian Assembly determined the fate of the Mityleneans, then changed its mind and decided to spare them.

This is a serious subject but it has had its lighter moments. A great friend, Roger Farley QC , a member of the Manchester Bar, a man of Blackburn, a character and mischief maker, now sadly deceased, was once defending a career criminal. The offence was very serious and his client, the defendant, whilst protesting his innocence throughout, was convicted by the jury on overwhelming evidence. He received a heavy sentence. Roger Farley QC went down to the cells to see him and the defendant was furious.

"Twenty years!", he said. "Twenty years for a crime I didn't commit!"

"Well, never mind," said Roger, "It's not so bad. Look at it this way. Just think what you would have got if you had done it."

What Jeremy Bentham would have made of that I cannot say.

Figure 5. Twenty Years

His Honour David Stockdale QC was called to the Bar in 1975 and for the next 35 years practised as a barrister in Manchester. He was appointed Queen's Counsel in 1995. In 2010 he took up appointment as a Circuit Judge and in 2013 as Senior Circuit Judge, Resident Judge at Manchester Crown Court and Honorary Recorder of Manchester. He was a Deputy High Court Judge and was authorised to hear cases of homicide and terrorism and to sit in the Court of Appeal Criminal Division. He retired in 2020.

Place-names and the medieval landscape in the Manchester area

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Place-names are so ubiquitous and so central to the mental maps of our existence that we generally take them for granted. For most of us how and why they came about, what they mean, and what they tell us about the past are unasked questions. They simply function as labels – proper nouns which we treat as ordinary nouns. But they are in reality a unique legacy from our distant forebears, coined by ordinary people - usually in their own vernacular language - to describe what they saw, to categorise the landscape and environment around them, to pinpoint the economic resources or distinctive characteristics of a location, or the ownership of land and estates. They, just as much as buildings and earthworks and stone circles, are monuments to the past. Historians now give considerable weight to them as evidence. A highly-specialised and often esoteric sub-section of historical research is concerned with *toponymy*, the study of place-names, their interpretation and their value as sources for social, economic, linguistic and landscape history.

In terms of their origins and meaning place-names fall into several loose groupings. Many describe the distinctive physical characteristics of a place or area: examples might include Radcliffe ('the red cliff', named for a red sandstone outcrop beside the Irwell); Sandbach ('the small sandy valley'); Liverpool (the distinctly unflattering 'muddy or dirty creek'); or the self-explanatory Moss Side. We know that Anglo-Saxon had a very large vocabulary of specialised terminology to describe particular shapes of hills, types of riverside land, or characteristics of woodland, and place-name analysis is continuously adding to the depth and sophistication of our understanding of this otherwise lost element of the language. Others names might relate to the typical vegetation of an area. Generally, this is about species which were and are common, perhaps growing there in distinctive abundance – for example Ashton ('the place of the ash trees'); Haslingden ('the valley of the hazels'); Salford ('the ford of the sallows') or Bramhall ('the corner of land with broom growing'). Sometimes it might derive from a notably unusual tree or plant: Parbold ('the cottage by the [wild] pear tree') is an example. Beasts and birds might also be recalled in evocative names. Without a doubt one of the finest in England is Wildboarclough, which needs no embellishment, but for example Rainow means 'the spur of the hills inhabited by ravens' and Hattersley is 'the clearing of the stags' (in Old English, *hēah-dēorl- lēah*, pronounced 'haydorl-lea').

As settlement, communications and exploitation of the land proceeded, names might reflect distinctive features – landmarks on journeys, or patterns of agriculture. For example, crossing places of rivers were important: Bradford ('the broad ford); or Stretford ('the ford on the street [Roman road]', while the practice of transhumance is reflected in a fascinating series of 'summer pasture' names in the Pennine fringes identified by the distinctive Irish-Norse element *aergi* with a personal name (thus, Anglezarke ('the summer pasture belonging to Anlaf'), Goosnargh (Gossan) and Grimsargh (Grimr). Other names indicate man-made features: Ancoats ('the lonely cottages'); Wilmslow ('Wighelm's burial mound'); Bury ('the fortified place'); Eccles ('[the place with a] church'); Reddish ('the reedy ditch', referring to the Nico Ditch, the post-Roman earthwork running from Ashton-under-Lyne to Stretford); or Bolton, which in 1212 was *Bothelton* and means, somewhat unremarkably, 'the place of the dwellings' or simply 'village'.

Ownership might also be reflected in a place-name. Sometimes this possession is generic in character: Bispham (*Biscopham*, 'the bishop's estate), Preston ('priest's town') or Prestwich ('priest's dwelling'); the several Chorleys in Lancashire and Cheshire, and the Chorltons, all mean 'settlement of the churls' (that is, free tenants in contrast to serfs). A splendid Mancunian example is Kirkmanshulme (literally, 'the church-man's meadow', meaning the priest of the distant forerunner of the cathedral). The place-name Walton is derived from an Anglo-Saxon word *wealh*, which means 'foreign' or 'outside'. It is why in English we have the name Wales, rather than Cymru: somewhat impertinently, the Anglo-Saxons described the native Celtic people as 'outsiders'! A Walton name therefore means 'place where the Welsh/foreigners' lived. Alternatively, and very frequently, a personal name might be used, specifying the owner himself, or much more rarely herself. In most instances we know no more about these people, though the linguistics of the name points to patterns of settlement and colonisation. Thus Urmston and Flixton were the *tūns* (or farming settlements) of Flik and Urm respectively, both being Scandinavian names, as of course is Knud in Knutsford. In contrast, Aldwine in Audenshaw (Aldwine's small woodland) and Dydd in Didsbury were Anglo-Saxon or English.

Many places are simply named for their location in relation to another place. These are especially obvious in the names such as Norton, Sutton, Easton, Weston and Middleton, but a type quite common in South East Lancashire and East Cheshire is the form that includes Heaton ('the higher place') or Lowton. Other locational examples include Norbury ('the northern fortified place') or Eastham, at the western end of the Ship Canal.

Interpretation and language

To interpret a place-name requires specialised linguistic skill, and it is essential to search for the earliest written form of the name. In north-west England this is often quite a problem, as our detailed documentary sources do not appear in quantity until the 1130s and 1140s. By national standards this is quite late – counties such as Wiltshire and Dorset have thousands of pre-Conquest

documents but Lancashire has fewer than a dozen. Some names do not appear until what are, in historical terms, recent centuries - for example, Moss Side is not recorded until 1530 (as *Mossyde*). But if we are fortunate there will be written records from the later 12th century and perhaps even earlier. Manchester is exceptional in that forms of the name, such as *Mamucio*, even appear in Roman itineraries, and two different versions of the *Anglo-Saxon Chronicle* for the year 923 give the name *Mameceaster* or *Manigeceaster*, the latter foreshadowing the modern form. Here the Roman name is generally considered to be a Latinised version of a Celtic name, meaning in some sense 'mother', to which the Anglo-Saxon 'ceaster', meaning a Roman camp, has been attached. More typical in documentary terms is, for example, Ordsall ('Ord[ric]'s riverside meadow'), first recorded as *Ordeshala* in 1177, as *Wurdeshal* in 1226, and as *Hordessale* in 1303.

Early written sources are therefore the vital material for researching the origin of place-names. The example below shows their characteristic form. This tiny document (Lancashire Archives DDHo 742) is a grant of land – in effect, a title deed - by which Margery, daughter of Robert of Ravensmeols (a lost village west of Formby that is now under the sea) granted land to Cockersand Abbey near Garstang. It is undated, but the names of the witnesses indicate that it was written between 1230 and 1240.

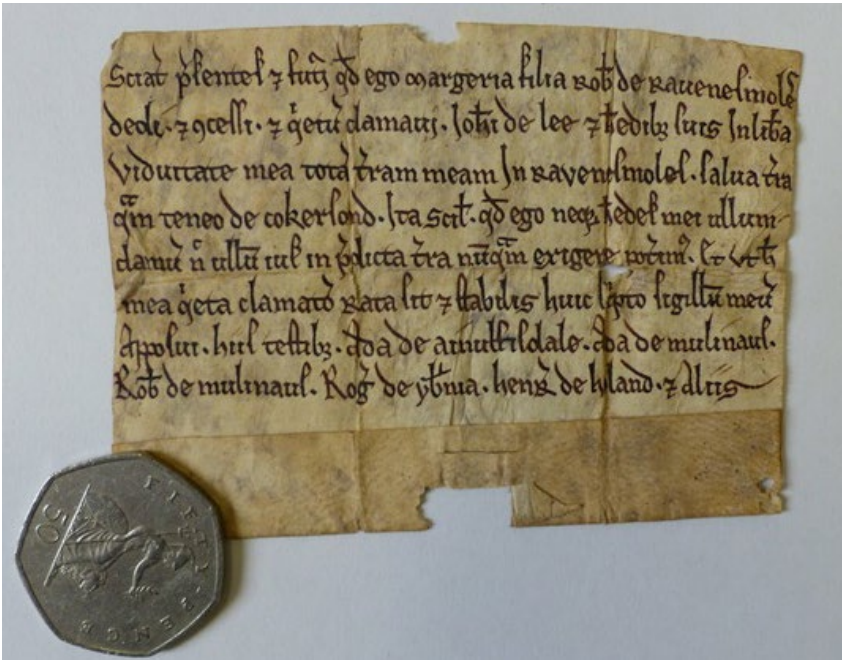

Figure 1. The grant of land to Cockersand Abbey.

There are five different place-names even on this scrap of parchment: *Ravenesmoles* (Old Norse, *Hrafnsmelr* 'Hrafn's sand dunes); *Cokersond* (Cockersand, 'the sands of the River Cocker', a Celtic river-name of uncertain origin); *Ainulfisdale* (Old Norse, *Einulfrsdalr*, 'Einulf's dale', the modern Ainsdale); Holand (Old English *hōhlond*, 'projecting ridge of land', the modern Upholland); and *Ybernia* (Hibernia, or Ireland).

This small document has names formed in four different languages: Old English (or Anglo-Saxon), Old Norse, Latin (*Hibernia*) and, in the case of Cockersand, a Celtic root. Linguistic analysis long ago demonstrated that place-names in North West England can in fact originate in one or more of seven languages. The first, distant and largely unknowable, is often termed Pre-Brittonic. It is one of the ancestral Indo-European languages which survives as certain types of place-name, of which river-names are the most important. We can see pan-European names which clearly demonstrate great antiquity, although there is still much debate about their origins and the extent of the survival of pre-Celtic elements. It is clear, though, that some names are ancient 'building blocks', found widely as simplex forms. A good example is the river that flows down from the Standedge Moors through Mossley, Stalybridge and Ashton to form the Mersey at Stockport. Its name, Tame, is identical not only with the several other Tames and Temes in England, but also with, for example, Thame, Tamar and Thames, and possibly derives from the Sanskrit / Indo-European *tamasa* which means 'dark' or perhaps, by implication, 'muddy'.

The influence of the next language, Brittonic (sometimes known as Cymric) is clearer. It was spoken by the Celtic inhabitants of our region and flourished from the 4th century BC, lasting in some areas until perhaps as late as 900AD. It was a close relative of Old Welsh, and slightly more distantly a cousin of Old Cornish and Old Breton. This was not a written language, or at least no documents have survived, but its linguistic closeness to Old Welsh, in particular, is demonstrated by place-names. These are predominantly topographical—describing landforms, vegetation and physical features—but an exception is the fascinating place-name Eccles, and its more complex variants Eccleston and Eccleshill. All derive from the late Latin *ecclesia* via the Brittonic or Cymric word for 'church', which was probably *egles* and identical to modern Welsh *eglwys*. Medieval Lancashire had six hundreds (the sub-county territorial units) and there is an *egles* place-name in each of these. Their significance is that the names in question were coined in the pre-Saxon period, using the Celtic language, and are therefore very good evidence of the existence of Christianity widely in Lancashire (and indeed Cheshire, where there is an Eccleston near Chester) prior to St Augustine's mission to Kent in 597.

A landscape element which can be identified in Brittonic or Celtic place-names is the word for 'wood'. In modern Welsh it is *coed*, in Cornish *cuit*, and in Breton *koad*. The family resemblance is absolutely clear, and it is postulated that in Cymric the word was *koed*. However, it seems that in some forms the ending had a soft 'th' sound, as with the letter 'dd' in modern Welsh. This meant that the word was pronounced 'ko-eth', and that is how it appears in some Lancashire

place-names. Penketh near Warrington, and Tulketh in Preston, are examples. But there was another potential change: Anglo-Saxon settlers, arriving in Lancashire in the mid-7th century, might also alter the pronunciation of the first letter. This happened with the word 'church', which might be pronounced 'kirk', as of course it is in Scots. So *koed* might be pronounced as spelled, or as *koeth*, or even as *choed* or *choeth*. Confusing it certainly is, but it explains two well-known place-names in the Manchester area: *koed* was transmuted by Anglo-Saxon tongues into *choet*, which became *Chet-* or *Cheet-*, hence Cheetham and Cheetham Hill, and indirectly Humphrey Chetham and his library; while south of the Mersey the same *choet*, with the addition of the Anglo-Saxon *lēah*, a clearing, became Cheadle. Meanwhile, the soft form remains virtually unaltered as the 'cheth' of Culcheth.

I mentioned Penketh as an example of a Brittonic 'wood' name. In fact both elements are Celtic. '*Pen*' is a very familiar element in modern Welsh names, meaning 'end of, head of': Bridgend, for example, is Penybont in Welsh. In Brittonic, and Old Welsh, *pen* apparently had a specific technical meaning, as the steep end of a wedge shaped hill (that is, a profile like that of a wooden door-stop). A good example is Penmaenmawr, 'the great stone hill-end', where the ridge ends in a cliff above the Irish Sea, and no less dramatic is Pendle, the unmistakeable profile of which dominates large areas of East Lancashire and Craven. The latter is a complicated name: 'pen', as noted, meant 'steep-ended hill'. To this unfamiliar term the Anglo-Saxons, assuming the hill was called 'Pen' added their qualifying word 'hill', making Pen Hill (in 1258 it was written as *Pennul*) and giving rise to the modern name Pendle. An unforgivable solecism is therefore to refer to Pendle Hill, for it is a triple tautology. While on that querulous note, a glaring local tautology is Longdendale, meaning 'long valley valley' (*denu*, Anglo-Saxon for valley + dale from *dalr*, a valley), now sometimes absurdly referred to as 'the vale of Longdendale' or the 'Longdendale valley'. To return to 'pen', the examples quoted are dramatic, but the distinctive profile did not depend on altitude. At Penketh, on the Mersey below Warrington, the steep slope above the river was less than 50 feet high, while at Pendleton and Pendlebury the east-west ridge terminated in the steep slope above the Irwell.

The variety of Brittonic or Cymric-derived names in Lancashire and Cheshire can be illustrated by some other examples. Werneth is from a postulated Brittonic name meaning 'place of the alders'. Preese near Blackpool and Preesall by Knott End both mean 'brushwood' or 'scrub', as in modern Welsh *prys*. Ince, of which there are two in Lancashire (and which became a distinctive local surname) is identical to the Welsh *ynys*, an island, in both instances meaning a dry place in the wetlands, while Heskin and Haskayne in West Lancashire mean 'sedges, rushes' as in the Welsh *hesgen*, a perfect descriptor for locations on the edge of the great mosses of the area. Another Celtic place-name which produced a characteristic Lancashire surname is Kenyon near Leigh. A century ago its likely derivation was ingeniously teased out by the great Swedish place-name scholar Eilert Ekwall. He could see no Old English or Norse explanation, but thought he recognised the Welsh personal name Einion. Imagining a suitable

Welsh word ending in a hard 'c' or 'g' (to give the equivalent 'k' sound) he came up with *crug*, a mound or hillock. So a Brittonic or Cymric name *cruc Einion*, Einion's hillock, was postulated, with a pronunciation of 'cr-kenion', the first syllable eventually being lost. The ingenuity of place-name linguistics is very great ... even though it is impossible to prove an explanation such as this with absolute certainty.

As we have seen, pronunciation of the same word might vary between areas, or between ethnic groups, just as it does today. A good example is the Anglo-Saxon place-name element meaning a [Roman] fort, derived from the Latin *castra*. In some parts of England the word had a hard initial letter, producing the modern element '-caster' or the simple place-name Caistor. In other areas the 'c' acquired a soft 'ch' sound, as in Chester or the many '–chester' names. The distribution is not even: 'caster' names are completely absent from Northumberland and Durham, South East England and the southern part of East Anglia, and are heavily concentrated in the Midlands. The implication is that the 'caster' form was particularly found in the Mercian dialects of Anglo-Saxon, while Northumbrian, and the forms used in Wessex, Kent and other kingdoms, tended to use the 'ch' form. However, in Cheshire, Lancashire and South Cumbria both forms are found (Chester, Manchester and Ribchester versus Lancaster, Hincaster and Muncaster). This accords with the external evidence of political control of the North West during the formative period from 600 to 850, when Mercian influence extending north from the West Midlands encountered Northumbrian influence gradually moving westwards over the Pennines. In other words, the place-names reflect a cultural and political complexity.

We can see the same principle of cultural and political complexity by mapping other basic place-name elements. Thus, the word for a small stream in Mercian dialect was what in modern English became 'brook', while in Northumbrian it was 'burn'. The linguistic boundary, where Northumbrian and Mercian met was eventually along the Ribble and up to the mouth of the Lune. To the north, 'burn' was the usual term, while 'brook' was characteristic of south Lancashire. In fact 'burn' was once found in south Lancashire – names such as Burnage are a reminder that it once existed locally – but there are more examples (such as Blackburn and Hindburn) in east Lancashire. So Mercian won the first battle of the dialects ... and then a third politico-cultural influence intervened: Scandinavian colonisation and control erased the word 'burn' from north Lancashire and replaced it with 'beck', now ubiquitous in Lancashire north of a line from Lancaster to Clitheroe.

Anglo-Saxon and Scandinavian landscape names

So now we have Anglo-Saxon and Scandinavian (which in this region mostly indicates Old Norse) to add to our list of languages. Between them they account for a very large majority of the place-names of the region, providing us with a wealth of historical detail which helps us to reconstruct aspects of the landscape a millennium and a half ago. Anglo-Saxon was first heard in the North West in

the early 7th century, while Norse settlement originated early in the 9th century and increased rapidly after 902, when there was a major influx of Norse settlers from Ireland, driven out by civil war in Dublin and coming to Wirral and the coast of South west Lancashire.

Culturally, therefore, South Lancashire, the Fylde and the Lune valley became an ethnic mixture of Anglo-Saxons, surviving populations of the earlier British inhabitants, and a strong Scandinavian element. The place-names reflect this, and reveal the landscape with which these people were familiar. There are several key words, and many names, associated with trees or woodland. One is very frequently found: the Anglo-Saxon *wudu* needs no explanation. Another is less familiar: the Old Norse word for 'swampy woodland' is *skogr*, and this produces place-names such as Burscough and Tarnscough in west Lancashire. Sometimes we find the same name in two languages: near Preston is Myerscough, an Old Norse name meaning the 'miry wood', while five miles to the south is Preston's most respectable and desirable suburb, Fulwood (*fūl-wudu*, the 'foul or filthy wood').

Figure 2. Lancashire: early medieval township names which refer to woodland and its clearance; note the concentration of clearance-type names in the Ribble Valley and the area south of Wigan and north-west of Manchester.

Some names relate to the trees found in the landscape. Ash, hazels and sallows have already been mentioned, but others include Birkdale (birches), Hollinwood (holly), Withington and Wythenshawe (willows or withies), Horwich (from the Anglo-Saxon *horan wican*, grey elm), Ellenbrook (alder, from the Old Norse *eller*), and Ogden (oak).

However, many woodland names relate to clearance, and these have much historical value as they have a comparatively clear chronology. The Anglo-Saxon word for a clearing is *lēah* (pronounced lee-ah). This is a very common element in Lancashire and east Cheshire, sometimes on its own (as at Leigh, or Lea near Preston, the latter still having its ancient pronunciation). More commonly it is found with another element: Kearsley (*caerse – lēah*, 'the clearing where cress grows'); Chorley ('the clearing of the churls'); or Astley ('the clearing of the ash trees'). There is a discontinuous line of *lēah* names extending from the edge of Chat Moss and the Mersey valley, through mid-Lancashire and into the Ribble valley, strongly implying that these were the areas of woodland clearance in the period from the 8th to the 11th centuries. The Old Norse equivalent was *thveit*, giving the modern 'thwaite' which is so common in Cumbria and Yorkshire and to a lesser extent north Lancashire: Rosthwaite ('clearing where horses graze'); Satterthwaite ('clearing used as a summer pasture'); or Grisenthwaite ('clearing used for pigs'). Most of these names date from the period 850-1100 when Norse settlement was most active.

In the later 12th century a new dialect word emerges, referring to the active contemporary clearance of woods to create new land for agriculture and settlement, a process formally known as 'assarting'. The dialect word is *rid*, and in place-names it appears as 'ridding', 'rode', 'rod' and, especially in Yorkshire, 'royd'. Because it is fairly closely datable to the 12th-15th centuries it is reliable evidence for the extension of the frontiers of settlement – it tends to be found in or close to the Pennine valleys and the fringes of the uplands, showing how more marginal land was being taken into use as the population grew and pressure was placed on existing resources. Examples include Blackrod, North Rode near Congleton, Rhodes (near Middleton), and Huntroyd near Burnley. In the Tudor period another dialect term appears, the Middle English 'stubbin' meaning 'to uproot tree stumps' (stubs). Stubbins near Ramsbottom is a good example.

Place-names can also tell us something of how these agricultural lands were used, and the resources which were derived from them. In Greater Manchester we have, for example, Bamfurlong near Wigan (in 1448 *Banforthlang*) meaning 'the bean furlong' – and nearby in Culcheth was Peasfurlong. Barton is from the Old English *beretun*, the corn farm (or later meaning 'manor farm'); Royton is Old English *ryge-tūn*, 'the place where rye is grown'; and Barlow [Moor] is *bere hlāw,* 'the hill where barley is grown'. Butterworth meant 'dairy [farm] enclosure', and Swinton was 'the farm of the swine, pig farm'. On that note, Lostock, now such a gracious suburb of Bolton, is from the Old English *hlose stoc* ('pig sties'). Shipperbottom near Bury was *Schyppewallebothem* in 1285, a name which breaks down into *sheep-well-bottom*, 'the small valley with a sheep-washing

place'. Fallowfield has a particularly clear meaning, relating directly to the traditional three-field rotation of medieval farming systems where one field was left fallow for several years to recover its fertility, and Falinge in Rochdale has the same root, the Old English *fælginge*, 'fallow land'. A few names tell of early industry: in 1322 Collyhurst had almost its present spelling, and it seems to mean 'the coaly or grimy hill', while Milnrow was *Milnehus* in 1292 and means 'the mill-house'.

Of course, these are just a few of potentially many thousands of examples, and I have not even ventured into the question of the minor place-names, those farms, fields, scraps of woodland and little watercourses. Furthermore, there are district names of great interest and it would be wrong to end without considering those, because South Lancashire and East Cheshire have particularly interesting examples. One is the suffix 'field'. Today we understand it to mean 'an enclosure, usually comparatively small and clearly defined', but historically it had almost the opposite sense: the Old English *feld* implied a broad open area, as in open country without woodland (the exactly equivalent Afrikaans word, *veldt*, has that meaning). The contrast was between the tree-covered part of the landscape and the large expanses of grassland. A good instance is Macclesfield, the first element of which is uncertain but may be from the Old English personal name Macca. Like much of the Pennine fringe, this was a heavily wooded area and it has numerous 'clearing' names (such as Alderley, Disley, Romiley, Mobberley). Around Macclesfield there was evidently a more open pastoral landscape, contrasting sharply with the wooded slopes and valleys. Likewise Makerfield, found today in the adjuncts to Newton and Ashton south of Wigan, was the district name for the whole area down to the northern edge of Warrington, an open expanse which contrasted with the woodlands which are reflected in the 'leigh' and 'ley' names close by. The first element seems to be the Brittonic equivalent to the Old Welsh *macyr,* a ruin. Did the pre-Saxon inhabitants gaze in awe upon the ruins of the Roman fort and town at Wigan, name the district as Macyr, from that ancient site, and then pass that name to the Anglo-Saxon settlers who added their *feld*?

Another district name is no less intriguing. The suffix of Ashton-under-Lyne is ancient indeed. It was once spelled in the same way as the 'under Lyme' of Newcastle, and the name is found in, for example, Lyme Park and Lyme Handley, Limehurst between Ashton and Oldham, and as the second element of Audlem and Burslem. The conventional explanation is that the term referred to a forest of elm trees, derived perhaps rather awkwardly from the Brittonic equivalent to *llwyf,* the Old Welsh for elm. But if the location of the 'lyme/lyne names is plotted, it can be seen that they neatly follow the foot of the great west-facing steep slopes of the Pennines. Indeed, they are only found on or near that north-south line. So more recently there has been much scholarly speculation, reviving an idea put forward in the nineteenth century, that the term is in fact a very early borrowing into Anglo-Saxon, perhaps via Brittonic, of the Latin word *limes*, meaning 'boundary' or perhaps 'edge [of a territory]'. Driving along the M6 through Cheshire and looking east the long dark line of the scarp above

Macclesfield and Congleton is very clear. Stand on the distant Wrekin, or look at the view heading south over Thelwall Viaduct, and it forms a prominent, even dominating element in the landscape – the natural topographical boundary between upland and lowland, hills and plain, softness and hardness. To our forebears 1500 years ago, and long before then, this dramatic feature was of major importance, commercially, agriculturally, politically, socially and psychologically. To them it was indeed the edge, the boundary of their territory. Surely *limes* is the best explanation of that mysterious place-name element?

A note on sources

The definitive work on Lancashire place-names is almost a century old. In 1922 Eilert Ekwall published *The Place-Names of Lancashire* (Chetham Society new series vol.81), a remarkable achievement which still has an honoured place. At the beginning of the 21st century Mary Higham, a noted place-name scholar, established a new Lancashire Place-Name Survey, which has since been gathering material from numerous local archive collections and collating the results so they can be interpreted and explained by Dr John Insley, one of Europe's leading place-name experts, who is originally from Preston but has long been based at the University of Heidelberg. The intention is that in 2022, to mark the centenary of Ekwall's book, the first volume of a new series of definitive works on the county's place-names will appear.

For Cheshire, the late John McNeal Dodgson undertook the compilation of the seven-volume series *The Place-Names of Cheshire*, published by the English Place-Name Society. The first volumes (including *Part 1 Macclesfield Hundred*, and *Part 2 Bucklow and Northwich Hundreds*, which between them cover most of East Cheshire) appeared in 1970. For more details of these and other volumes see https://www.nottingham.ac.uk/research/groups/epns/survey/volumes.aspx.

A very informative and up to date website is 'Key to English Place-Names', based at the University of Nottingham's Institute for Name Studies. It is built around an interactive map and database of major (that is village, township and parish) names, giving full explanations and alternative interpretations, and is highly recommended (http://kepn.nottingham.ac.uk/).

Alan Crosby has a doctorate in geography from the University of Oxford and is a well-known local and regional historian. He is a council member of the Record Society of Lancashire and Cheshire, the Chetham Society, and the Cumberland and Westmorland Antiquarian and Archaeological Society, and since 2001 has been the editor of the national journal The Local Historian. He has published numerous books and papers on aspects of the landscape and social history of North West England.

George Bernard Shaw as Music and Opera Critic

ANTHONY OGUS

28 November 2019

Although in terms of performances, the plays of George Bernard Shaw have fallen somewhat out of fashion, he remains a major cultural figure of the late 19th and early 20th centuries. Less well known among his output are his writings on music which provide testimony not only of literary skill and profound insights into music but also an acute perception of late Victorian society.

Shaw was born in 1856 into a middle-class Anglo-Irish protestant family. Strongly antipathetic to his education in Dublin, he left school at the age of 15 and for five years worked principally as a clerk to an estate agent. He then moved to London where his enthusiasm for self-improvement led to considerable intellectual and literary activity. His new spiritual home was the Reading Room of the British Museum and his involvement in philosophy and politics led to important networking so that, for example, he was involved in the founding of the Fabian Society.

As an author, he did not get off to a good start, writing five unsuccessful novels before his first major play, *Widowers Houses*, was performed in 1892. So "to earn some income from his pen" he turned to music criticism. From 1885 to 1894 he wrote regular columns for weeklies, notably *The Star* and *The World*, many of them under the pseudonym Cornetto di Basso. This proved to be a most fertile and reputation-acquiring activity: the collected articles when published later in book form[1] amounted to over 2,000 pages.

Shaw had had no formal music training but was very knowledgeable on the subject, influenced to some degree by his mother, sister and a household lodger George John Lee who was, among other things, a singing teacher. From an early age, music had played an important part in his life:

> It was from Handel that I learned that style consists in force of assertion. ... From Beethoven, I learnt my flexibility and catholicity... Mozart, the master of masters, taught me how to say profound things and at the same time remain flippant and lively.[2]

The reasons for the popularity, even notoriety, of Shaw's writings on music are not hard to locate. In the first place, they revealed erudition and profound knowledge of music and its performance, combined with an acute critical faculty. Secondly, there was the literary style, robust, witty and with an elegant turn of phrase and clever use of paradox and hyperbole. Thirdly, he captured so brilliantly the characteristics of music performance in late Victorian society. Finally, the mischievous, sometimes outrageous, audacity that Shaw displayed

made them hugely entertaining. An example which succinctly illustrates much of this:

> The performance was admirable on the part of the orchestra, and as good as could have been expected on the part of the chorus but Miss Amy Sherwin displayed a virtuosity in the art of singing flat which no stretch of critical indulgence would justify me in ignoring.[3]

As regards composers, Shaw - more than most critics - had his preferences, or should we say, prejudices. His undoubted favourites were Mozart and Wagner - he was the author of *The Perfect Wagnerite*[4], a commentary on the *Ring* well ahead of its time and still in print. He considered that Dvorak was overrated, but his real bête noire was Brahms, who was too heavy, too ponderous for his taste:

> There are some experiences in life which should not be demanded twice from any man, and one of them is listening to the Brahms Requiem.[5]

Nor did he have much admiration for the leading contemporary figures in English music. His reviews were much resented by the pillars of the establishment, Mackenzie, Parry and Stanford. Here was his trenchant riposte:

> [W]ho am I that I should be believed, to the disparagement of eminent musicians? If you doubt that [Stanford's oratorio] Eden is a masterpiece, ask Dr Parry and Dr Mackenzie, and they will applaud it to the skies. Surely Dr Mackenzie's opinion is conclusive; for is he not the composer of Veni Creator, guaranteed as excellent music by Professor Stanford and Dr Parry? You want to know who Parry is? Why, the composer of Blest Pair of Sirens, as to the merits of which you only have to consult Dr Mackenzie and Professor Stanford.[6]

Shaw provided vivid descriptions of the Victorian music scene, not least of the audiences. The period preceding that in which he was writing had seen a gradual evolution in concerts from private salons to public halls particularly, of course, for the performance of oratorios. He was stirred to lampoon Saturday afternoons at the Crystal Palace when

> the land brings forth the oratorio public, who swarm over the room, with Novello scores in all their borders.[7]

At the other end of the social scale, performances for the noble and rich at the Royal Opera House Covent Garden were treated as "post prandial resorts" with long intervals for socialising and with the house lights up throughout so that patrons could come and go as they pleased. Eccentricity extended to dress, Shaw being offended by, for example, the presence of one lady sitting in front of him with "stuck over her right ear the pitiable corpse of a large white bird"[8]. For him, audiences were typically insufficiently sensitive to a singer's musical qualities, being interested more in brilliant high notes:

> The audience behaved much like a church congregation, stolid, unintelligent, and silent, except when one of [Emma Albani's]

> highest notes excited the representatives of that large and influential section of the public which regards a vocalist as an interesting variety of locomotive with a powerful whistle.[9]

The phenomenon is, of course, still with us, as are other crowd-pleasing vocal indulgences which attracted Shaw's criticisms, such as interpolating a high note at the end of a song or aria. In one article he reports on an exchange of correspondence with a singer who recognised that the practice was "inartistic" but felt that he was bound to indulge in it since "if he finds a high note brings him success ...'to earn my living I must please my audience'". An outraged Shaw promised him a "slating from at least one critic". [10]

Opera at Covent Garden during the relevant period was dominated by singing and the audience's adoration of singers to the neglect of other aspects of the noble art. Shaw's reviews, critical of the phenomenon, attempted to redress the balance. He was one of the few to recognise the crucial importance of conductors and lauded the qualities of Hans Richter, Felix Mottl and Franco Faccio compared to those of Enrico Bevignani and Michael Costa ("there are few persons whom I have less desire to see again"), the regulars at the Bow Street house.[12]

He also was intolerant of singers, particularly famous singers, who did not take acting sufficiently seriously. The most famous tenor of the period Jean De Reszke is a good example. Performing the title role at the first Covent Garden performance of Verdi's *Otello*,

> in simulating the epileptic fit in which Otello's fury culminates, he moved the gods to laughter by lying down with a much too obvious solicitude for his own comfort.[13]

But his most virulent comments were directed against the inadequacy of staging. Of course, the function of the modern stage director did not exist at the time. Singers were mainly left to their own devices with a "stage manager" taking responsibility for basic movements and the general appearance of the presentation - and, if credence is to be given to Shaw, not always very competently. The technology for the stage presentation was limited and scenery and costumes were afflicted by an obsession to achieve authenticity even for pieces set in mythical times. Shaw's experience of Wagner's *Parsifal* at Bayreuth, inspiring though it proved to be, was marred by images of the

> Gower St. sofa visibly pulled on to the stage with Madam Materna seductively reposing on it, the steam from a copper bowl under the boards which filled the house with a smell of laundry, the indescribable impossibility of the wigs and beards, the characterless historical-school draperies of the knights, the obvious wire connection of the electric light which glowed in the ruby bowl of the Holy Grail...[14]

Because Shaw's negative reviews were often so amusing, they have tended to outshine other, more positive, contributions which he made to the evolution of musical culture. In a number of respects, his perceptions proved to be ahead of his time and to have had lasting value. An obvious example is his almost

Marxist interpretation of Wagner's *Ring*[15] which was not to be applied to the staging of the work until the 1970s.[16] Another is his early recognition, at the British première of *Manon Lescaut*, that Puccini would carry the torch for the future development of Italian opera.[17]

He was, it should be admitted, a perfectionist, sometimes to an alarmingly intolerant degree. His high expectations arose from his deep knowledge of musical compositions, acquired by the reading of scores, and also the fervour which he brought to his love of great works. Both of these are exemplified by his evident frustration at many Wagner performances. Familiarity with the scores of the epic works must have created in his mind sublime images which could not easily be realised by late nineteenth-century performers and artists. This is what he wrote about the music dimension of a *Rheingold* performance at Covent Garden (his comments on the staging were even more severe).

> The band, no longer braced up by the excitement of the first night, did what I hope was its worst. Its playing of the wonderful water music prelude suggested that the Rhine must be a river of treacle and rather lumpy treacle at that; the gold music was arrant pinchbeck; Freia's return to heaven brought no magical waftings of joy to the audience; and the rainbow music, with its hosts of harps might have been pleasant deck music during a steamboat excursion to Hampton Court, for all the success it attained in providing a splendid climax to the prologue of a mighty drama.[18]

How should one sum up the lasting value of Shaw's music criticisms? Clearly, they are highly entertaining and brilliantly written and on these criteria alone merit a place among literary classics. They are also very much of their period, since they capture so vividly the characteristics and eccentricities of the music scene at the end of the nineteenth century. Yet, in their insistence on integrity and quality in performance, they reach forward to contemporary artistic values. Perhaps wisely, few modern critics are willing to be as outspoken and, at times, as cruel as Shaw, but the splendour of these writings undoubtedly emanates to some extent from the author's highly personalised perspective. He should be allowed to have the last word on this.

> Criticism without personal feeling is not worth reading. It is the capacity for making good or bad art a personal matter that makes a man a critic. The artist who accounts for my disparagement by alleging personal animosity is quite right: when people do less than their best, and do that less at once badly and self-complacently, I hate them, loathe them, detest them, long to tear them limb from limb and strew them in gobbets about the stage.[19]

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The Eco-Time Capsule Project: POPULATION MATTERS

JOHN GUILLEBAUD

11 December 2019

We have not inherited the earth from our grandparents – we have borrowed it from our grandchildren.
Kashmiri proverb, the basis of the project described below[1]

Unremitting growth: it's the doctrine of the cancer cell.
Sir Crispin Tickell, Patron of Population Matters

I have not seen a major environmental problem facing our planet that would not be easier to solve if there were fewer people – or harder, and ultimately impossible, with ever more.
Sir David Attenborough, Patron of Population Matters

Successive UK governments' Chief Scientists and the last President of the Royal Society have all referred to the approaching 'perfect storm' of crises in this century related to environmentally unsustainable human population growth. In this they were no more than replicating the fully evidence-based "wake-up calls" of others, throughout the 238 years since your esteemed professional society was founded. Some of these far-sighted individuals are listed below:

200 years of intermittent warnings to the world on the risks of unremitting human population growth

Thomas Robert Malthus - 1798
John Stuart Mill - 1848
Norman Borlaug - 1970
Paul Ehrlich and John Holdren - 1971
Maurice Strong - 1992
Nobel and other World Scientists' Warning - 1992
[World Scientists' Warning repeated at + 25 - 2017]
Science Summit on World Population New Delhi - 1993
David Attenborough – 1994, and often repeated since
The Environment Time Capsule Project - 1994

Saying "sorry" to the future[1]

In the Eco-Time Capsule project, environment time capsules (Eco-TCs) were buried in 1994 in the Botanic Gardens of Kew, Ness, South Africa, Seychelles, Sydney NSW and Mexico. Generally, time capsules record a particular time and place for posterity, and are buried without establishing any future date for 'un-burying'. These were different. An environmental activist since medical school days, I was re-energised in 1992 by the UN's Environment Conference at Rio and the recent World Scientists Warnings (see box). Then I came across the saying:

> We have not inherited the earth from our grandparents, we have borrowed it from our grandchildren.

I concluded that the latter will be justifiably furious if by then we have wrecked their "loan" to us.

Therefore the Eco-TCs, buried on or about World Environment Day in June 1994, will be disinterred in 2044 - ie after exactly 50 years, by 'our grandchildren'. They contain relevant 20th century artefacts labelled BAD [eg some fossil fuel and a CFC aerosol] or GOOD [my own cycle pump and - of equal relevance environmentally - a pack of contraceptive pills…], along with entries by hundreds of schoolchildren in a nationwide competition for the best letters, poems and pictures. Along with others contributed by adults, these items apologised for "disruptive climate change" long before this was a common concern, as well as "the extinction of numberless species" through habitat destruction, and other dire impacts anticipated by 2044 through ever increasing numbers of planet-trashing humans. BUT those involved did not, and do not, just wring their hands and apologise.

Our Promise? This was to work towards "changing hearts, minds and policies" (including population policies) "before it's too late" - with the explicit ultimate objective to achieve long-term sustainability. So that, against the odds, 'sorry' in 2044 would not need to be said!

There is more at www.ecotimecapsule.com including Christopher Guillebaud's video which "encapsulates" this, to see/hear and maybe forward…

How has the planet fared since the warnings and pledges of 1992-1994?

Since 1994, reliable reports on the planet's health have found water, land, plants, animals and fish stocks all in "inexorable decline". The climate emergency is for real, as shown by ever more extreme climatic events - wild fires, droughts, hurricanes and floods whether by fresh- or sea-water - and the observable positive feedbacks that threaten irreversible chain-reactions (eg the "methane gun" from melting polar permafrost and reduced albedo, the reflecting-effect, as white ice melts). But greenhouse gases (GHGs) including CO_2 and methane are not the only air pollutants of concern: disease-inducing fine particulates, released in city streets everywhere and as indoor pollutants from cooking and heating of dwellings in least developed countries, are estimated to cause over 8 million annual deaths.[2]

The United Nations' Global Environment Outlook reports[3] regularly warn of a steady progression of unprecedented ecological damage, the principal 'upstream' driver of which is human population - which at 7700 million in 2019 "had reached a stage where the amount of resources needed to sustain it exceeds what is available". Each year there are in the world about 140 million births and 57 million deaths, or an annual increase of about 83 million.[4] Every four days now, a city for 1 million people is appearing, somewhere – with all that that implies for additional energy use, GHG emissions and trashing of habitats for wildlife.

Earth Overshoot Day marks the annual date after which humanity's aggregate demand on Nature exceeds what the earth can regenerate in that complete year. Thereafter we are in 'overshoot'. Calculated to be July 29 in 2019, it comes sooner each year.[5] Humankind already uses 170% of what the earth can renew, i.e. its biocapacity (as in forestry, fisheries, croplands), and is on track to attempt by 2050 to utilise the resources of two planets. But there is no Plan(et) B…. This one is our only home, it is finite and moreover 70% of its surface is salt water. Half the rest is desert, mountain, or icecap. Achieving sustainability is not an option, it's all about how we get there. Shall it be, as Maurice Strong pointed out at the Rio environment conference in 1992, through many fewer births or Nature's way through very many more deaths? See Figure 1.

We know what to do about it! Clearly, those who consume way beyond their share, the rich over-consumers in every country, must massively reduce their environmental footprints. But also relevant is the 'number of feet' everywhere, and as we shall see the number of rich persons' feet has the greatest impact. Reducing over-consumption and the numbers who will do the consuming, are two sides of the same coin. Contraceptives are as important for environmental sustainability as bicycles and solar panels....

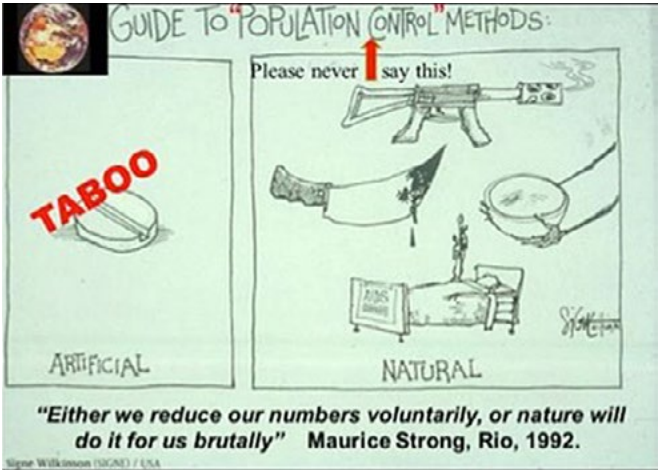

Figure 1. A guide to 'Population Control' methods

The WWF's 2018 Living Planet Index measures biodiversity abundance levels and each biennial report shows a continuing downward trend among invertebrates (including bees and other pollinators) and vertebrates (birds, fish, reptiles, amphibians and mammals). The average vertebrate population was estimated to have declined by about 60 percent since 1970.[6] In a business-as-usual scenario, this downward trend in species populations continues into the future. A sixth major extinction event is under way, with one species H. sapiens (sic) the culprit: other species are becoming extinct a hundred times faster than the rate in the fossil record. Of the total mammalian biomass on land, in the most recent estimate (2018), a mind-blowing 96% is the flesh of humankind or our livestock (cows, pigs etc) and pets[7] leaving just 4% for all wild mammals put together.

Note: Though not 'on the radar' of most commentators, even the Covid-19 virus pandemic (which happens to have begun in December 2019, the month my lecture was given) had its roots in ecological disruption and over-population[3]. It is hardly unexpected that the microbes of zoonotic diseases would utilise the vast 'culture medium' presented by all that human flesh.[7] The pandemic is in truth another symptom of the existential threats to all life resulting from an excess of human life.

The need for agricultural land has increased[6] as populations, living standards, meat-eating (importantly this is responsible for c20% of GHG emissions) and demand for biofuels all rise. There is no new land: except through continuing deforestation (at over 1 million hectares per month). A hectare that yielded 1.8 tonnes of crops in 1987 now yields 2.5 tonnes, through greater use of fertilisers and water - but often leading to land degradation. The rise even in non-meat productivity is through relentless forest-burning (a major source of CO_2) plus use of fossil fuels for tractors, refrigeration and more. Hence, the reason for ever more GHGs is primarily because of more mouths to be fed.

Other examples of ecological damage:

- Global fresh water supply has become a serious threat as the demand for irrigated crops soars. The UN reports[3] that only one in 10 of the world's major rivers reaches the sea all year round, because of upstream irrigation, with close to 2 billion likely to suffer absolute water scarcity by 2025. Humans will soon be fighting over water, just as they always did, and will, fight over resources of land, fuel and minerals.
- Marine life: often overlooked, this is in similarly dire straits. On current trends by 2050, the total mass of plastics in the oceans may equal the weight of all fish.[8] Toxic pollutants are adsorbed into the micro-plastic 'nurdles' which imitate plankton, so entering the food chain and, ultimately, our kitchens. While helpfully absorbing CO_2, the oceans are acidifying and warming, bleaching coral reefs and decimating marine habitats. About 30 per cent of global fish stocks, a key protein source for billions, are classed as "collapsed" and >40 per cent are "over-exploited".

The 'P' in the I=PAT equation.

The Eco-TCs highlight the (only) three factors that create humanity's environmental (including climatic) impact. These were first identified in 1971 by Ehrlich and Holdren, then in 1972 related by an equation[9] - in my view the most important simple equation ever derived:

$$\text{Environmental impact, } I = P \times A \times T$$

in which A is the per person affluence (material resource consumption and the concomitant "effluence" of pollutants such as plastics, industrial chemicals and CO_2); T is the technology impact per person (in which for example fossil fuels measure more highly than solar based energy); and P is the population (the number of persons). No other factors have been identified, so how come, that the P-factor, over-population, remains persistently "the elephant in the room that no-one talks about"?

In his RSA President's lecture[10], Sir David Attenborough quoted from *Foresight: The Future of Food and Farming* (2011).[11] That report, he said:

> describes the many obstacles to feeding >7000 million people, increasing in numbers by 80 million (the population of Egypt) each year: soil erosion, salinization, the depletion of aquifers, over-grazing, the spread of plant diseases by globalisation, the absurd growing of food crops to turn into biofuels to feed motor-cars instead of people, and so on. It makes a number of eminently sensible recommendations, including the need for a "second green revolution". But, surprisingly, it doesn't state the obvious fact that it would be much easier to feed 8 billion people than 10, so measures to achieve this – voluntary accessible family planning and women's education and empowerment - should be a central part of any programme of action for food security. It doesn't mention what every mother subsisting on $1 per day already knows, that her children would be better fed if there were four of them round the table rather than ten.

Sir David went on:

> I meet no-one who privately disagrees that population growth cannot ever continue indefinitely. No-one except flat-earthers can deny the planet is finite. We can all see it in that beautiful picture of our earth taken from the Apollo mission. So why does hardly anyone say so publicly? There is a bizarre, sustained taboo around the subject. The taboo doesn't just inhibit the politicians and civil servants who attend the big conferences. It even affects the people who claim to care most passionately about a sustainable and prosperous future for our children, the environmental and development NGOs. Yet silence implies that their admirable goals can be achieved regardless of how many people there are in the world, even though they all know it can't.

> I simply don't understand it. It is all getting too serious for such fastidious niceties. It remains an obvious and brutal fact that on a finite planet human population will quite definitely stop at some point. And that can only happen in one of two ways. It can happen sooner, by fewer human births – in a word by contraception. This is the humane way, the powerful option which allows all of us to deal with the problem, if we collectively choose to do so. The alternative is an increased death rate – the way which all other creatures must suffer, through famine or disease or predation. That translated into human terms means famine or disease or war – over oil or water or food or minerals or grazing rights or just living space. There is, alas, no third option of indefinite growth.

A bigger bucket – or turn the tap off? If the world were run by biologists like Sir David, rather than economists, our leaders would recognize what all species get to know by hard experience: that multiplication beyond ecological limits leads to a crash. If population gets 'on their radar' at all, political leaders commission demographers to monitor their country's growth, but treat that as a "given": something to be (with increasing difficulty) adapted to, not as something amenable to intervention. This is analogous to monitoring the filling of a bucket and, when it's close to overflowing, discussing complex measures to make the only available bucket larger… rather than turning off the tap.[12]

Population Matters…'Too many people, not enough planet'[12]

"The world has enough for everyone's need, but not enough for everyone's greed!" - are both parts of Mahatma Gandhi's famous saying still true? Or is the first statement no longer true? Doesn't the evidence indicate that we are close to having too many 'everyones' for all the need to be met, given our one finite world?

How did this come about? Mostly, not by people actively planning to increase numbers (though some groups, mostly religious or political, do just that, to increase their voice or voting strength). It was the unintended consequence of medicine finally becoming effective, primarily through public health and sanitation since the mid-19th century, and then of antibiotics since the mid-20th. Whereas from the dawn of history a couple would have to have 5 or more children for 2 to reach adulthood, now most children do this. The world has been painfully slow to act to restore balance, once the extra births became unnecessary.

Even when that need for balance is accepted, a common myth originating in some bad programmes of the past (eg India in the 1970s, China since 1980) is that any quantitative concern about population must necessarily and intrinsically be coercive – particularly of poor people. Not so, as well as being abhorrent, compulsion in reproductive health has usually proved counter-productive anyway. This damaging myth can be perpetuated by the misleading and avoidable (see Figure 1) phrase "population control". We are inadequately resourcing the voluntary things that work: primarily, ensuring that any sexually

active woman on the planet who wants to use contraception has that choice. Not doing this is probably the ideal way to ensure that more future Governments will legislate, regrettably, for birth control policies that really do involve coercion. Others distrust this quantitative concern as inevitably exclusive - of other key humanitarian interventions: climate justice, poverty alleviation, measures to improve child survival and eliminate gender-based violence and discrimination, promoting women's education and rights. But this is not an "either-or" matter, it can be "both-and": by making contraceptive care a fully-funded and priority component of optimal development aid.

Current good news and bad news about population growth[12]

Small thanks to worldwide opponents of family planning, since mid-20th century the world's mean total fertility rate (TFR or mean family size) has reduced impressively, from 5.2 to 2.4 in 2018. So about 50% of humans now live where mean family size is at or below replacement levels (UN and PRB data). Indeed, in 2013 an influential TV film by Hans Rosling gave many the impression that the population problem is essentially 'sorted'.[12]

However even here there is hidden some "bad news". First, c.45% of the world's people live in countries with TFRs from 2.1 to 5, and 9% have even higher TFRs. In the 48 UN-designated Least Developed Countries (LDCs) the population was projected in 2015 to triple by 2100. In much of sub-Saharan Africa fertility reduction has stalled. The UN's median projection of 11.2 billion by 2100 is predicated on continuing reductions in TFR: in their absence the constant fertility variant projects to an ecologically apocalyptic total, c.28 billion by 2100. Secondly, a major problem is inexorable "demographic momentum", due to the population 'bulge' of young people who have yet to start their families, born when TFRs were higher. In (for example) Niger and Uganda, 50% of the population are not yet grown-ups: all under the age of 15. They will be tomorrow's parents.

It's really all about SEX!

Economists who argue that poor people need and choose to have large families ignore one vital fact: that potentially fertile intercourse occurs far more frequently than the minimum needed for desired conceptions.[13] Hence having a large, rather than a small, family is usually not, as portrayed, a planned decision - couples in low resource settings (LRSs) actively setting out to have many children for economic and 'social security' reasons, or, given expected high child mortality in such settings, to 'be on the safe side'. It is instead an automatic outcome of human sexuality. Something active needs to be done to separate sex from conception - namely, family planning (FP). Without that being accessible, the 'default state' for absolutely all fertile couples is a large family: quite simply that's what happens when you are not able to not have a large one... It's not the poor having more sex. If fertile, sex at normal frequency plus absent FP equates to a large family. No "trying" needed! Access to FP being often difficult for poor people, many children arrive by chance not by choice (though then often,

and naturally, welcomed). The primary cause is the many barriers to women being able to choose a smaller family - including the basic barrier of no access to a good range of the FP methods.[14] Obviously, increasing per-capita wealth usually removes that and other barriers. Yet there is no need to wait in the (often forlorn) hope of that happening, or use compulsion to hasten change. There is no country with above replacement fertility which cannot now, with zero coercion, make a good start in enabling couples to reduce average family size:

- For a start, there is a wide-open door of need. Despite the well-known cultural and religious endorsement for large families in many LRSs, very few women want the maximum biologically possible number of children (>8), and teenage and late-order births are frequently regretted. Between a 1/3 and 1/2 of all conceptions are not planned, totalling about 80 million per year, about half of which are (often unsafe) abortions. Survey data show that about 215 million women without access to modern contraceptive methods want no more children.
- To change the context of decision-making in LRSs requires contraceptives to be available and accessible and promoted, by good use of the Media.[15] Primarily by education the multiple barriers to their use need to be removed. These include fatalism ('God has planned my family size'), misinformation about contraceptive side effects, religious prohibitions, political correctness[13]. Eliminating the barriers to women, caused largely by men, in a rights-based way, is the tried and tested means which worked in the many success-story countries (eg Iran or Thailand) and states (eg Kerala). See also my 2013 lecture: 'Sex and the Planet'.[16]

Family planning "could bring more benefits to more people at less cost than any other single technology now available to the human race," James Grant (Annual Report UNICEF 1992, p 58)

But, Grant went on to say: "it is not appreciated widely enough that this would still be true if there were no such thing as a population problem," because it is also preventive medicine, a directly humanitarian intervention. People suffer – mostly women and children – if family planning is inaccessible.

There is a rightful concern about coercive contraception, but coerced conceptions are bad too: when women are forced to conceive through obstruction of their modern-day human right to control their own fertility. Without unwanted conceptions the world's outrageous maternal mortality – c800 mothers dying, nearly all avoidably, every 24 hours - could reduce by 35%. You cannot die of a pregnancy you don't have.

The "Tragedy of the unregulated Commons"[17]

When the proverbial camel collapses with a broken back, remember, the last straw did not really do it. It was the fault of all the straws. We all share the planet in common, so for environmental sustainability everyone must be involved. Garret Hardin documented a seemingly inevitable 'tragedy' whenever, in previous centuries, a field of common land was about to be over-grazed. He explained how each herdsman finds it advantageous, personally and for his

family, to put another cow on the land - and another and another, despite the later arrivals being manifestly thinner and less productive than before as the grass disappears - right to the point that the grazing limit is exceeded. Then all the cows die and all the families suffer. The personal self-interest of the individual is thus at the common cost of the whole group, progressively and ultimately, without intervention, catastrophically. This is Hardin's 'tragedy'. A more modern example is: to each fisherman it remains acceptable to take his boat to the nearly over-exploited fishery - getting ever smaller and fewer fish. But still he says "my boat is my livelihood, it's those other fishermen that are doing the over-fishing"- right until, predictably, the fishery collapses. Much is encapsulated in the sayings: "My car is my car – everyone else's car is traffic!" and in the context of human numbers: "My extra baby is my right, (OR, my own group's right, my religion's right) - everyone else's baby is over-population."

Hardin said the intervention to avoid inevitable collapse or 'tragedy' was "Mutual coercion, mutually agreed upon", meaning everyone recognising their own contribution to the problem and agreeing to be regulated, whether by peer-pressure or fiscal 'sticks and carrots'. So in the fishery example, each fisher takes an agreed, smaller, sustainable quota.

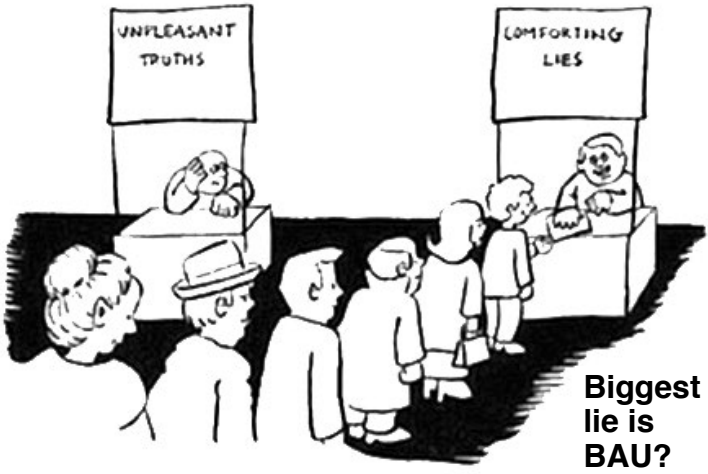

Figure 2. The reassurance of lies

However, when push comes to shove, "Why do I bother to do the right (often inconvenient) things to help humankind or the environment, when seemingly no-one else does?" The environmental 'cheats' de-motivate the potential "good guys" so even they, sometimes at least, do the same "business as usual" (BAU) things: things that are easier, but environmentally unsustainable. Given there

will always be people reassured by lies (Figure 2) - or simply self-interested regardless of others - how can this mutually assured, per-person reduction of environmental impact by everyone possibly happen?

The hope is that once the potential for the 'tragedies' is fully understood, altruism will be reinforced by 'calculated self-interest'. Might religious or spiritual motivation help? All religions encourage love for one's neighbour. Faith communities and, indeed, many non-religious groups with the same maxim, must perceive that we can hardly claim to be truly 'loving our neighbour' if we deny environmental and climate justice to our neighbour *overseas* (who already suffers most from climate change); OR, as the Eco-TC project highlights, our *future* neighbour (likely to receive from us an unsustainably over-populated and thereby trashed planet)? Besides the use of 'greener' technology and less consumption per-person, this requires a change of mind-set for many theists, to accept that their god's command to multiply and "fill the earth" has now been well obeyed; plus there was no order to overfill it! Ensuring best practice in rights-based contraceptive care for all so that - competing for what's left of the finite earth - there are not overwhelmingly too many future 'neighbours': is that not a mighty good way to 'love' them?

More on climate change - and education

In 2009 it was estimated[18] that by adopting available 'eco-friendly' actions, including meticulous recycling, an American couple could curb their lifetime carbon footprint by 486 tonnes. Simply by having one less child an American woman would reduce her 'carbon legacy' - ie the summed emissions of herself and her descendants weighted by relatedness - by 9,441 tonnes. This is about 20-fold (in the UK c10-fold) more than saved by the other positive eco-actions. Such calculations highlight how wrong it is to campaign only that poor people in the LRSs should have small families! Affluent people in this world of (in 2019) 7,700 million, should surely plan a smaller not larger family, regardless of their ability to provide for the latter; adopting the voluntary guideline of a maximum of two children advocated by Population Matters[19] of which I am a Patron.

Two facts are incontrovertible: our finite planet will not support unending growth; and once a mean TFR of 2 (or slightly higher, with current mortality rates) becomes the mean world family size, population growth will eventually cease. So why should it be controversial to propose that parental replacement fertility becomes the accepted upper-limit norm, with full 'ownership' by Civil Society, everywhere?

The obstacles are massive, not least that in all settings, for probably most women and very many men, there is a feeling - often reinforced by culture and religion - that they cannot satisfy their parental instincts by having two children, leave alone just one. These instincts often trump, sadly, the altruism to change one's preferences in the interests of posterity and the biosphere.

The obstacles are not insuperable: education is key, including population & environmental education

The importance of this is clear: out of over 80 climate change interventions available now, combining women's education with voluntary family planning came second in Scenario 1 of Project Drawdown.[21]

That said, despite having, usually, higher education, many affluent couples - in all countries – are inexplicably uneducated environmentally, lacking a concept of finitude of the planet or the unsustainability of unremitting growth of human numbers. They can acquire this. It is patronising to suggest moreover that less prosperous and literate people lack the intelligence to do the same, if given the opportunity by education and the media - see box below - as indeed was demonstrated by interviews about adaptation to climate change in Ethiopia.[22]

Environmental and reproductive health education via the media

- Sexual and reproductive health has been successfully promoted in many countries through radio and TV 'soap operas'.[20]
- These long-running culturally-embedded dramas educate through their popular characters who are torn between good and bad influences.
- Studies show societal benefits: demeaning attitudes and abusive behaviour towards women are thereby changed and the listening audience discovers inter alia the benefits of family planning and small family norms.
- This "Sabido methodology" utilising "info-tainment" can also be used, as in Rwanda, to promote environmental conservation and sustainable agriculture.

The affluent do at least have the means to be able to access contraceptives, unlike many in Africa, the continent of my birth. However the shocking incidence of unplanned conceptions in both teenagers and adults - 40% in the world (annual total c.80 million) and 49% in the affluent US - shows there is much more to it than access! Any contraceptive may fail. Any guideline on family size norms must never penalise large families. There must always be a good safety net for unintended/later-order births.

Crucially, to criticise parents at any level of affluence, anywhere, who have already had larger families is decidedly unfair if this environmental dimension was not remotely in their mind-set, having never previously been brought to their attention (however well-informed some of them are about almost everything else!)

How many wake-up calls does humanity need?

They come almost daily now, from Extinction-Rebellion and Greta Thunberg on each Friday-for-the-Future, all endorsed by the 99% of climate scientists who become collectively more frantic with each IPPC report, showing global warming increasing inexorably to or above 2 degrees Celsius, the level which poses an "existential threat to the human race". Scary words, yet disregarded they cannot be. They are evidence-based. Among the most authoritative and most scary of alarms were:

> World Scientists' Warning to Humanity - A Second Notice (1992 repeated at +25 in 2017). In 1992 the following was signed by over half of all living Nobel Laureates:
>
> > The earth is finite. Its ability to absorb wastes and destructive effluent is finite. Its ability to provide food and energy is finite…. Pressures resulting from unrestrained population growth [Then: 5.4 billion. In 2017: 7.6 billion] put demands on the natural world that can overwhelm any efforts to achieve a sustainable future. If we are to halt the destruction of our environment, we must accept limits to that growth….No more than one or a few decades remain before the chance to avert the threats we now confront will be lost and the prospects for humanity immeasurably diminished.
>
> In 1993 the Statement from the Science Summit on Population declared: we must achieve zero population grown within the lifetime of our children.[23]
>
> In 2017 over 20,000 scientists worldwide signed off with:
>
> > To prevent widespread misery and catastrophic biodiversity loss, humanity must practice a more environmentally sustainable alternative to BAU 'business as usual'. This prescription was well articulated by the world's leading scientists 25 years ago, but in most respects, we have not heeded their warning. Soon it will be too late to shift course away from our failing trajectory, and time is running out. We must recognize, in our day-to-day lives and in our governing institutions, that Earth with all its life is our only home. [24]

An existential threat to all life, not only human life? A personal conclusion

It gives zero pleasure to be proved right. There are now more than enough humans already born to comprehensively trash this fragile, beautiful blue and green planet before the end of this century. Climate change alone may suffice to make a major proportion of it uninhabitable. What is totally unavoidable and certain is an eventual return to some form of sustainability. Can we avoid "Nature's route" to effecting this, as in Figure 1 and the quote from Maurice Strong?

Relevantly, in all the worst-case "perfect storms", advocacy for birth reduction through access to voluntary contraception does not cease to be crucial, it just then becomes a last-resort measure, to reduce suffering. How? Through lowering possibly by billions the number of humans to die prematurely, along with much non-human life, through the expected mega-hurricanes, floods, fires, unprecedented mass starvation, pandemic diseases and violence with social collapse in later decades of this century. Fewer humans born now to suffer in that dystopian future can only help.

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John Guillebaud is Emeritus Professor of Family Planning and Reproductive Health, University College London (UCL). He spent his early life in Burundi, Rwanda, Uganda and Kenya. While a 2nd year medical student at St John's Cambridge, a lecture on the risks of population growth by the biologist Colin Bertram triggered his specialisation in sexual & reproductive health & rights (SRHR), seemingly the obvious career path for a doctor concerned for the planet [as later expanded in his 'BMJ Confidential' profile at www.bmj.com/content/348/bmj.g2456.full*]. This logically led to higher degrees in both surgery and gynaecology and over time to about 4000 vasectomies and a similar number of fertility-regulating procedures for women, in parallel with his enthusiastic educational, training and research activities and numerous publications, including two textbooks in the field that have both been 'best-sellers' for over 30 years. His Personal Chair at UCL in Family Planning and Reproductive Health in 1993 was the first in the world awarded to a clinical gynaecologist. Professor Guillebaud's vision was and is that the population factor P in the Ehrlich-Holdren equation for environmental impact should be addressed in affluent as much as in low-resource settings: yet always wisely and compassionately, through education via schools and media, along with voluntary, accessible and rights-based family planning services, made accessible as a choice by removing many barriers which may be tangible (absent services), or intangible (eg cultural/religious pronatalism).*

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The Internet of Things

NIGEL LINGE

4 February 2020

The Internet can trace its origins back to the ARPAnet of 1969. Funded by the Advanced Research Projects Agency in the USA, the ARPAnet was designed to maximise access to, and use of, the large and expensive mainframe computers of the day. This was achieved by connecting them together to form a network that scientists and engineers could then use to gain access to the computers via remote terminals. Creation of the ARPAnet was led by Bob Taylor who became the Information Processing Techniques Officer of ARPA in 1965 and Larry Roberts, who had already experimented with interconnecting computers via telephone lines, who was appointed manager of the project. By December 1969, the first four computers had been interconnected. These were a Scientific Data Systems Sigma 7 at the University of California in Los Angeles, a Scientific Data Systems 940 at the Stanford Research Institute, an IBM 360 at the University of California in Santa Barbara and a DEC PDP-10 at the University of Utah. However, it was decided that these computers were unable to perform their normal computing functions in addition to the added burden of network communications. Therefore an '*Information Message Processor*' or IMP was specified as an intermediate communications node (today referred to as a '*router*') providing the interface between the ARPAnet and the mainframe computers. These IMPs were produced by Bolt Beranek and Newman and were based on a Honeywell DDP-516 mini-computer and cost $50,000 each.

The ARPAnet (Internet) expanded rapidly but twenty years after its creation it remained the preserve of scientists, researchers and engineers working for large corporation. The general public had neither access to it nor an awareness of its existence. It was an '*Internet of Computers*' used for data processing and transfer between large mainframe installations. That, however, was about to change. Working at the European CERN laboratories an English scientist called Tim Berners Lee was taking an interest in how information could be more effectively linked and shared between computers and over networks such as the Internet. In March 1989 he submitted a proposal[1] that would lead to the creation of what became known as the '*World Wide Web*'.

The creation of the World Wide Web provided a new and rich source of content that business, commerce, governments and the general public could all benefit from. A desire to gain access to such content fuelled a new demand for an Internet connection which led to the creation of Internet Service Providers (ISP). In the ten years from 1990 to 2000, the number of Internet users, measured as a percentage of global population, rose from 0.2% to 6% as shown in figure 1. This period is an important one because it signifies a transition in

usage and the onset of sustained growth. It is perhaps best summarised by the 42nd President of the United States, Bill Clinton, who in 1996 said:

> Nobody who wasn't a high-energy physicist had even heard of the World Wide Web before I became President [1993]. And now even my cat, Socks, has his own page.

The Internet had evolved into an '*Internet of Content*'.

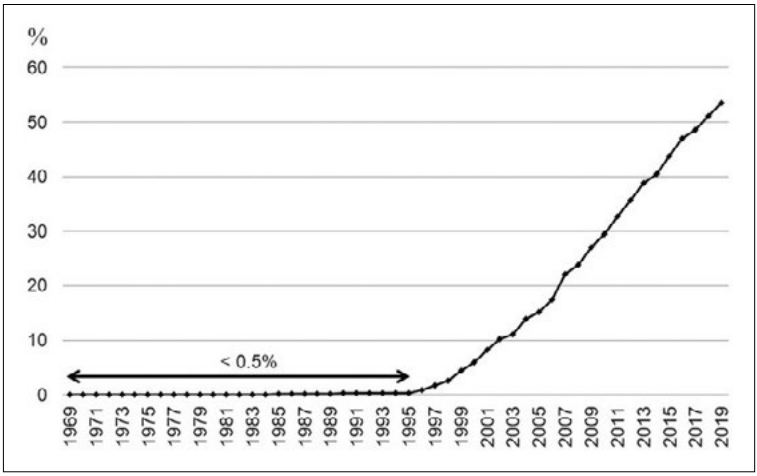

Figure 1: The percentage of the global population who are Internet users (1969–2019)

Thereafter, the next evolutionary step came in 2002 with the emergence of Web 2.0 technologies which allowed people to become contributors of content as well as consumers of it. It was this advance that facilitated the launch of social media sites such as Facebook, Twitter and YouTube thereby transforming the Internet into an '*Internet of People*'. That, together with improvements in home access networks, further drove growth with the number of Internet users rising to 29.3% of the global population by 2010 as per figure 1. It is also worth noting that within this same time period, the mobile phone was rapidly becoming an Internet connected device. The Nokia 7110 launched in 1999 was the first to include a fully integrated web browser and by 2010, higher speed 3G networks were available and the smartphone had become firmly established in the market. This trend continued and as reported in Ofcom's Communications Market Report[2], when analysing the amount of time spent using the Internet by device, the smartphone was identified as the *"preferred device, regardless of where people are accessing the internet, even at home (37% of the time spent online at home is on a smartphone)".*

Usage of the Internet has continued to grow with figures produced by the International Telecommunications Union[3] showing that for 2019, the total number of Internet users stood at 53.6% of the global population. However,

this and the previously quoted figures refer to people and how they access and use the Internet. Today, humans are but one category of user, the other being devices that connect to the Internet in order to carry out tasks that may or may not involve humans. For example, a sensor on a shipping container can report its location and environmental status as part of an automated logistics process. Any device that is connected to the Internet is referred to by the collective noun, '*thing*'. Hence, the next phase in the evolution of the Internet is described in terms of creating the '*Internet of Things*' (IoT).

Determining when the Internet of Things (IoT) was born is open to interpretation but according to the network technology company Cisco[4], they define it as the point in time when more things or objects were connected to the Internet than people. According to their metrics this was sometime between 2008 and 2009. Predictions for growth vary in terms of precise figures but not the shape of the trend. For example, IoT Analytics is a leading provider of market insights and they predict that there will be a 17% year-on-year growth in the global IoT market resulting in 21.5Bn connected devices (excluding smartphones, tablets or laptops) by 2025 which clearly dwarfs the 7.8Bn people on the planet and the 4.2Bn of those that are currently Internet users.

The IoT is already impacting many aspects of everyday life from consumer to business applications and some of these will now be examined.

The IoT in the Home

Within the home, IoT technology is transforming our houses into connected or smart living environments. For example, the British Gas Hive system can connect the central heating boiler, room thermostat, lights, and electrical appliances together through a hub which itself connects to the Internet via a domestic broadband service. These devices can then be controlled from an Internet connected tablet, laptop or smartphone from anywhere in the world. Taking this a stage further, a smartphone app can be configured to automatically switch the central heating or other appliances on or off dependent upon your distance from home. Devices such as motion sensors and cameras can also be connected thereby allowing you to remotely monitor the current status of your home and respond to any alarms that are triggered.

Televisions have for some time been classed as smart in the sense that they are connected to the Internet to access streaming and catch-up services thereby adding them to the IoT. According to Ofcom's Media Nations report[5], approximately half of UK homes subscribe to streaming services with Netflix, Amazon Prime Video, Now TV and Disney Life being the most popular platforms. This equates to 13.3 million homes but with many households subscribing to more than one service, the total number of subscriptions exceeded 19 million in 2018.

Even domestic appliances, such as the refrigerator can be connected to the Internet. In a UK survey published by Ernst and Young[6] in 2019, they noted that "*households are becoming increasingly receptive to smart home technology, as lower price points make new products more accessible*". When asked what smart

home device they would most like to own in the next five years, topping the list at 41% was a digital home assistant and smart heating, followed by smart security (37%), smart lights and video doorbells (36%) and then a smart speaker (34%). A smart washing machine (19%), fridge (19%) and oven (17%) took the bottom three places.

Digital Home Assistants appeared on the market in 2015 and have been a remarkable success story with 22% of UK households now owning one. Leading the way are the Amazon Echo with its Alexa assistant and Google Nest with its Google Assistant. Both provide a voice interface that can interpret human speech allowing you, for example, to search the Internet, ask questions, play music or listen to a radio station. However, what is often not appreciated is that the artificial intelligence software that interprets our voice commands is located, not in the device itself but on a server located somewhere on the global Internet. Remote processing of this type is more commonly referred to as a cloud service. In a similar way to the Hive system, these devices can be expanded into full-blown smart home controllers able to manage heating, lighting, and a wide range of electrical appliances.

The IoT in Healthcare

Diabetes currently affects over 400 million people globally and in India Vodafone are using the IoT to provide 800 patients in Bangalore with remote diabetes treatment. Partnering with Diabetacare, patients are given a device for measuring glucose and blood pressure levels which are then automatically sent over Vodafone's network to a central server which can be accessed for analysis by specialist clinicians. If any abnormal readings are found, the patient is contacted by a health care professional and offered a personalised treatment schedule.

In Liverpool, a 5G Health and Social Care testbed[7] is being used to provide a pharmacy assistant that helps people take medication safely at home using a live video link to a qualified pharmacist. The same project is also protecting vulnerable people living at home by installing IoT sensors that can detect if they have had a fall or if there are any changes in their normal patterns of behaviour. Finally, a push-to-talk device combats isolation by connecting people for a chat or to engage in games or other such engagement activities.

In November 2019 the University Hospitals Birmingham NHS Foundation Trust in partnership with BT demonstrated what they claimed to be the UK's first remote diagnostic procedure using a 5G connected ambulance. With this technology, clinicians can work with a paramedic in the ambulance to remotely diagnose a patient. Wearing a virtual reality headset, the clinician sees exactly what the paramedic sees, can direct them to carry out specific tasks and receives a live data feed of the patient's vital signs. Such technology allows for a faster diagnosis which in turn can save lives and can potentially reduce the number of visits to A&E departments.

** The term 'cloud' originates from the fact that large networks such as the global Internet are often represented by a cloud symbol. Therefore, using the prefix 'cloud' refers to something that is provided by remote servers connected to the Internet hence, the terms cloud storage, cloud processing and cloud services.*

The IoT in Vehicles

Vehicles are also now regarded as being part of the IoT with the global connected car market expected to rise at a compound annual growth rate of 17% to exceed $225Bn by 2025. Technology can monitor the performance of a vehicle, track its location, record how it is being driven, detect if it is involved in an accident and read information from roadside infrastructure to automatically detect speed limits.

In Milton Keynes IoT technology is being used to improve car parking[8]. It is estimated that it costs around £15,000 to create a new parking bay and so it is important that they are fully utilised. Milton Keynes council noted that there could be 7,000 car parking spaces vacant at any one time yet drivers continually complaint about not being able to find a place to park. The solution to this problem has been to install an IoT sensor in each parking bay that can detect if is empty and communicate this information wirelessly to receiving units on lampposts. From there it is sent to a central server where it is collated and made available via Google maps thereby allowing drivers, in real time, to identify the vacant spaces.

Perhaps the most extreme example of the IoT connected vehicle is the autonomous or self-driving car. Almost every major car manufacturer has at least undertaken research into self-driving cars including of course, some new entrants such as Google. In November 2019, O2 signed an agreement to provide a 5G network at the Smart Mobility Living Lab in London, the world's most advanced urban testbed for connected and autonomous vehicles. The aim is to develop and evaluate vehicle to vehicle and vehicle to road infrastructure technology to build safer, more intelligent and better joined-up transport systems. On a smaller scale, the University of Salford has invested in a Navya driverless vehicle as part of a research programme being undertaken on the Peel Park campus as shown in figure 2.

Figure 2. The Navya driverless vehicle on test at the University of Salford's Peel Park campus

The IoT in Agriculture

Farming is also benefitting from the IoT. According to the UN Food and Agriculture Organisation, the world will need to produce 70% more food by 2050. However, with shrinking agriculture lands, the focus must be on increasing yields. Precision agriculture or smart farming uses IoT technology to ensure optimum application of resources to achieve high crop yields and reduce operational costs. Sensors placed in the soil can detect moisture and nutrient levels thereby enabling a more efficient use of irrigation and the application of fertiliser. Data collected from crops can determine the optimum time for harvesting which in turn can assist with plans for storage and distribution. Livestock tracking and geo-fencing enables a farmer to monitor animals remotely and receive alerts if they venture beyond defined boundaries which in turn helps prevent the spread of disease and lowers staff costs. Drones are increasingly been used to enhance crop health assessment, crop spraying, field analysis and to assess the impact of flooding. Tractors and other farm vehicles are fitted with satellite navigation systems to ensure more accurate planting and harvesting of crops.

It is anticipated that by the end of 2020 the agriculture industry will have deployed 75 million IoT devices in a market that is expected to triple by 2025, reaching $15Bn.

The IoT in Cities

Our cities are increasingly becoming smart through the deployment of IoT technology. Environmental sensors monitor air quality which then form an input to automated traffic management systems. Copenhagen uses sensors to monitor the city's bike traffic in real-time thereby providing valuable data on how to improve cycle routes in the city which is especially important because more than 40% of the city's residents commute by bike.

Amsterdam is truly embracing the IoT for throughout the city they have established a series of living labs comprising extensive coverage of free WiFi, a new fibre network and hundreds of navigation beacons located on lampposts and bus stops. Coupled to a policy of open data which gives access to information such as census data, electricity usage and roadworks, the city has become a testing ground for businesses and residents to experiment with and develop projects to improve healthcare, the environment and efficient energy utilisation. Homes are being equipped with solar panels, energy storage units and smart meters which are all integrated to manage more efficiently energy distribution by using local storage to offset peaks in demand on the main electricity grid and to allow residents to sell spare capacity back to the grid. With over 1,000km of canals, Amsterdam is also trialling autonomous boats designed to move people and goods around the city. Sensors monitoring water and air quality offer a new means to detect diseases and clear canals of floating waste. All this infrastructure and associated initiatives have combined to make Amsterdam Europe's most successful smart city.

Smart buildings are another important aspect of the IoT city. In its simplest form, IoT within buildings comprises a network of sensors, meters, appliances and other devices that can send and receive data and if necessary, be accessed and managed remotely via the Internet and cloud services. Automation systems for lighting, heating and ventilation, safety and security are all benefiting from IoT connectivity with advanced analytics being applied to the data collected in order to create an intelligent building management system. This is delivering lower energy consumption, reductions in maintenance costs and tighter security. A rising adoption of IoT-enabled building management systems is a major contributing factor in driving the growth in the smart building market which is predicted to grow from $61Bn in 2019 to $106Bn in 2024.

Even street furniture has become part of the IoT city. The new generation of phonebox exemplified by BT's Link, figure 3, and New World Payphones' Amscreen kiosks, contain digital screens that can be managed remotely. Whilst for most of the time these display advertisements which is the key source of revenue that keeps them on our streets, at times of emergency, they can rapidly become public information points. This has already been demonstrated very successfully during the COVID-19 crisis where such kiosks have been used to display public health notices during periods of lock-down.

Figure 3. BT's Link kiosk (phonebox)

IoT Challenges

The IoT ecosystem comprises five key elements. Firstly, devices and sensors collect data. Secondly, this data must be transmitted over a network to some form of collection point. Whilst the recent launch of the 5G mobile network has focused on the higher download speeds it can deliver for smartphone users, one of primary applications intended for 5G[9] is massive machine-to-machine communications which in reality means the IoT. Thirdly, all data collected from IoT devices needs to be processed which can be as simple as checking that a temperature reading is within limits to considerably more complex tasks such as pattern and behaviour recognition. Fourthly, data visualisation is key because the massive amounts of data being collected, often referred to as big data, cannot be easily assimilated by humans. Finally, data analysis and prediction delivers the intelligence which determines the future actions that must be taken.

Naturally such an ecosystem brings with it many challenges. Small, IoT devices lack the computer processing power and memory storage to perform sophisticated security algorithms. Hence, this creates a cyber-security point of weakness which in turn means additional security measures must be implemented deeper within the IoT systems in order to keep them secure. The amount of data being generated by IoT devices is forecast to grow to almost 80ZB by 2025. Storing, managing and processing this data to make it meaningful and useful is a key challenge for computer and data science. Our increased reliance on IoT solutions in turn requires ultra-reliable devices, networks, servers and algorithms. If the server goes down or the network fails, then your smart home will cease to be smart! Designing and building fault tolerant and redundant IoT systems is therefore a major technical challenge. Finally, of course, there is the socio-economic challenge. This covers the full spectrum from the cost of deploying IoT technologies to concerns about surveillance societies in a world where everything is connected to everything else.

Conclusion

The Internet of Things (IoT) is the next phase in the evolution of the global Internet which has been transformed from a network that was intended to connect computers, to one that connected people and now connects things. Increasingly though, the term IoT is being used to define objects that simply '*talk*' to each other. By combining connected devices, it is possible to gather information, analyse it, and take action to assist with the completion of an automated task, predict a future action, reveal new insights or deliver learning. It is about devices, communication networks and data. Combining these delivers a fully connected world.

This is not science fiction for the IoT is real and already impacting many markets including the home, healthcare, vehicles, agriculture and cities, all of which have been examined in this paper but there are many, many more.

* *ZB = ZettaByte = 1021 Bytes or 1 trillion GigaBytes*

The IoT has the potential to increase dramatically the availability of information and is likely to transform not only companies and organisations in virtually every sector around the world but also society and our everyday lives.

Globally, the IoT market is expected to be worth around $1.5Tn by 2025.

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The Turret at Brantwood: Ruskin's Faulty Tower?

CHRISTOPHER DONALDSON

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Are nature and architecture two sides of the same coin? John Ruskin thought so. He held that all true architectural forms were taken from the natural world. He also maintained that good buildings should be attuned to their environment. In this essay, I shall examine the development of these principles in Ruskin's early works, paying particular attention to his celebration of the cottage architecture of the English Lake District. Ruskin, as we shall see, followed William Wordsworth in admiring the way the region's vernacular buildings suited their surroundings.

But in addition to drawing attention to this link between Ruskin and Wordsworth, I also want to consider the peculiar light in which it puts some of the changes Ruskin made at Brantwood, his Lake District home, during the early 1870s. Brantwood is an integral part of Ruskin's legacy, and some commentators have observed how the additions Ruskin made to the house and its grounds reflect his architectural principles. Keith Hanley, for one, has written that these 'various accretions exemplified the [sort of] organic architectural growth Ruskin favoured'.[1]

Figure 1. Undated photograph of Brantwood; photographs: Box 7

In what follows, I want to complicate this view, and I shall do so by considering whether Ruskin's additions at Brantwood actually fit with his ideals. I shall take the turret room on the southwestern side of the house (Figure 1) as my main example. This room was among the first changes Ruskin made after purchasing the property, and it is a favourite of visitors to Brantwood today. But does it accord with the principles Ruskin espoused? Or is it out of touch with its setting? Addressing these questions, as I hope to show, can reveal a good deal about both Ruskin's approach to architecture and the contradictory nature of his thinking.

It is worth bearing in mind at the outset that Ruskin was not an architect, at least not in the proper sense of the word. He thought and wrote about architecture at length, and he even designed a number of architectural features. (The windows of Oxford's Natural History Museum, for instance, are indebted to his drawings.[2]) But as Geoffrey Tyack has noted, Ruskin 'never designed a building'.[3] His approach was, by nature, more philosophical than practical. It was informed, as Ruskin later explained, by his interest in the way architecture could reveal the 'true character' of civilisations.[4]

Figure 2. John Ruskin, 'Coal merchant's house in Market Street, Croydon' (c.1830–1840); pencil, watercolour and bodycolour on paper; 24.2 x 17.5cm. Access. no. 1907P141
Image Courtesy of Birmingham Museums Trust (CC0 1.0)

But this is not to suggest that Ruskin's knowledge of architecture was unempirical. Nothing could be farther from the truth. Even as a boy, he made first-hand studies of grand and common buildings alike. His drawing of the coal merchant's office that stood near his aunt's house in Croydon (Figure 2) is an especially striking example of the latter. Such works were rooted in Ruskin's own experiences, and they aided him in developing the methods he later applied in projects such as *The Stones of Venice* (1851–1853): his monumental, three-volume investigation of the built environment of the city with which he is still most strongly associated.

Ruskin's birthplace, 54 Hunter Street, Brunswick Square, London, might not seem a likely setting to inspire an interest in historic architecture. In 1819, when he was born, the Square was still a fairly new neighbourhood. But his father, John James Ruskin (1785–1864), was a wine merchant, and he was obliged to leave London periodically to call on his country customers. Often, during the summer months, these business journeys doubled as family outings, and Ruskin would later recall the wonder he felt in being taken to the houses of the great and the good. His education, as he opined, owed much to 'an early life of more travelling than is usually indulged to a child' (5.365). (All further references to the Library Edition of Ruskin's *Works* are cited by volume and page number in this way.) In his later years, he acknowledged how this 'travelling' had influenced his notions about the links between architecture and politics. '[A]s I grew older', he explained:

> I thus saw nearly all the noblemen's houses in England; in reverent and healthy delight of uncovetous admiration,—perceiving, as soon as I could perceive any political truth at all, that it was probably much happier to live in a small house, and have Warwick Castle to be astonished at, than to live in Warwick Castle and have nothing to be astonished at; but that, at all events, it would not make Brunswick Square in the least more pleasantly habitable, to pull Warwick Castle down. (35.16)

These are the words of an adult moralising on his childhood memories. But the passage does suggest how visiting ancient buildings quickened Ruskin's awareness of the connection between architecture and culture, on the one hand, and the preservation of political order, on the other. He reinforced that point a sentence later by poking fun at his American readers. 'And at this day,' he chuckled, 'though I have kind invitations enough to visit America, I could not, even for a couple of months, live in a country so miserable as to possess no castles' (35.16–17). Hailing as I do from the States, I try not to take the slight too seriously.

What really matters though, is that the ideas Ruskin formed about historic buildings in his youth were reinforced by his skills as an artist. Ruskin sketched assiduously while on tour with his parents, and the works he produced affirm the influence of his early drawing masters, Charles Runciman (1798–1864) and Copley Fielding (1787–1855). The copy of Runciman's 'Hampton Court', which Ruskin made when he was fourteen, is a notable case in point

Figure 3. John Ruskin, 'Hampton Court', after Charles Runciman (1833); pencil on brown paper; 27 x 40 cm. Invent. no. 1996P1312
© The Ruskin – Library, Museum and Research Centre, Lancaster University

(Figure 3). As a drawing, it reveals the depth of the impression Runciman had made on his conception of how to perceive the world around him. The fact that the drawing is unfinished is immaterial. For it is not just a picture. It is a study: a work undertaken to train the eye to look, and the hand to record, with care. And Ruskin's methods of composing such studies evolved as he fell under the sway of other artists, most notably J.M.W. Turner (1775–1851) and Samuel Prout (1783–1852), who influenced Ruskin's first encounters with the historic cities of Continental Europe in 1833 and '35.

But Ruskin was not only drawn to the great buildings of Europe and Southern England. Even in his youth, he was passionate about the rural architecture of Northern Britain. He had fallen in love with the mountain regions of the Lake District and Scotland while still a boy. And when he returned to the Lakes in 1837 and '38, he decided to dedicate serious attention to comparing the district's vernacular buildings with the ones he had seen in France, Switzerland and Italy.

Ruskin was especially fascinated by the distinctive features of the Lake District's cottages, such as the one in the farmstead he paused to draw while passing through St John's in the Vale in 1838 (Figure 4). Such buildings, he reasoned, were admirable for the sake of their solitude, simplicity and humility. For it was on account of these qualities that they complemented their surroundings and, in doing so, contrasted the more ornamental sorts of mountain cottages found in other parts of Europe.

Figure 4. John Ruskin, 'Castle Rock, St John's Vale, Keswick' (c.1838); pencil and watercolour; 31.3 x 28.7 cm. Invent. no. 1996P2067
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The splendid houses he had seen among the Swiss Alps, with their neatly patterned woodwork, stood out to him as exemplary (Figure 5.overleaf). Compared with such 'elaborate' designs, the cottages of the Lake District possessed a pleasing 'severity of character' (1.48). Such a building, wrote Ruskin, had

> no foppery about it; not the slightest effort at any kind of ornament, but what nature chooses to bestow; it wears all its decorations wildly, covering its nakedness, not with what the peasant may plant, but with what the winds may bring (1.48).

Figure 5. John Ruskin, 'Alpine view with house'; pencil; 17 x 19.5cm.
Invent. no. 1996P2038
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These remarks come from 'The Poetry of Architecture', the long essay in which Ruskin brought his thoughts about the buildings of Britain, Switzerland, France and Italy together to establish a set of standards for architectural criticism. This essay was Ruskin's first book-length publication, though it was not printed in book form until 1893. Instead, it originally appeared in instalments in the *Architectural Magazine* between 1837 and '38. For Ruskin, who was still a teenager at the time, the essay was a significant achievement. But like many young authors of his era, he chose not to publish his work in his own name. Instead, he used the pseudonym 'Kata Phusin' ('according to nature').

This assumed name is noteworthy. As Ruskin later remarked, 'I could not have put in fewer, or more inclusive words, the definition of what half my future life was to be spent in discoursing' (35.224). Significantly, as Keith Hanley has pointed out, the phrase 'kata phusin' echoes the first fragment of Heraclitus: 'I describe each thing, distinguishing it according to its nature' (ἐγὼ διηγεῦμαι, κατὰ φύσιν διαιρέων ἕκαστον).[5] But there is a distinction to be drawn here. For whereas the quotation from Heraclitus refers to the nature, or rather character,

of each thing, Ruskin clearly had a more general, ecological notion of nature in mind. Hence, the maxim he laid down earlier in his essay: 'the material which Nature furnishes, in any given country, and the form which she suggests, will always render the building the most beautiful, because the most appropriate' (1.47).

This notion of nature stands out clearly in the image of the cottage presented in the passage quoted above. As his description suggests, part of Ruskin's aim in 'The Poetry of Architecture' is to distinguish the characteristics of buildings that are well-suited to their surroundings. His criteria are more picturesque than practical. He is more interested in visual aesthetics than structural mechanics. And at times, his assertions endorse an idealistic primitivism with which few modern homeowners would sympathise. Few people, I suppose, would really wish to see their homes decorated with little more than 'what the winds may bring'.

Still, as Ruskin's words make plain, he held that the cottages of the Lake District embodied this ideal to the utmost. They were built of stone taken from their surroundings. They were as weathered as the hills around them, and they were just as overgrown with mosses, ferns and lichens. They were, in short, at one with their setting. 'Observe', he writes:

> how perfectly [such a] cottage fulfils the conditions [of solitude and humility] which were before ascertained to be necessary to [its] perfection. Its colour is that of the ground on which it stands, always subdued and grey, but exquisitely rich, the colour being disposed crumblingly, in groups of shadowy spots; a deep red brown, passing into black, being finely contrasted with the pale yellow of the Lichen geographicus […]: the mass, consequently, at a distance, tells only as a large stone would, the simplicity of its form contributing still farther to render it inconspicuous. (1.47)

This sort of painterly description suits the idiom of Ruskin's essay. As such statements suggest, his concern in 'The Poetry of Architecture' was more with visual appreciation than conservation. And, in this sense, the essay can be seen to anticipate arguments developed in his later works, including *The Seven Lamps of Architecture* (1849) and *The Stones of Venice*. It is not for nothing that his editors, E. T. Cook and Alexander Wedderburn, dubbed 'The Poetry of Architecture' the 'germ' of Ruskin's architectural thought (1.xliii). But it is also worth noting that the thought this essay germinated belongs to a strain of thinking which had already borne fruit in the works of other writers.

Ruskin was not, after all, the first celebrant of the Lake District to make such claims. Nearly thirty years earlier, William Wordsworth had expressed similar views in his account of the agricultural communities of his native region. Like Ruskin after him, he wrote evocatively of the fitness of the colour and shape of each cottage and farmstead to its setting:

> The dwelling houses, and contiguous out-houses are in many instances of the colour of the native rock out of which they have

> been built; but frequently the dwelling house has been distinguished from the barn and byre by rough-cast, and white wash, which, as the inhabitants are not hasty in renewing it, in a few years acquires, by the influence of the weather, a tint at once sober and variegated […]; so that these humble dwellings remind the contemplative spectator of a production of nature, and may (using a strong expression) rather be said to have grown than to have been erected;—to have risen by an instinct of their own out of the native rock; so little is there in them of formality; such is there wildness and beauty. [6]

Ruskin does not mention Wordsworth in his essay. But he was steeped in Wordsworth's writings, and this description of the 'humble' cottages of the Lake District as natural extensions (or even extrusions) of their environment undoubtedly influenced Ruskin's characterisation of such dwellings in 'The Poetry of Architecture'.[7] Ruskin's remarks may not 'as readily produce the assumption of organic continuity from local landscape to human construct', as Hanley has commented.[8] Nonetheless, his admiration of the way such cottages were attuned to their surroundings was clearly inspired by Wordsworth. Like Wordsworth, he held that these vernacular buildings were 'native' to their environment, and as such they accorded with their setting.

Like Wordsworth, moreover, Ruskin's celebration of the virtues of such buildings was a counterpoint to his condemnation of the vices of more ostentatious structures, such as the villas which had begun to appear in the Lake District during the late 1700s. One thinks, for instance, of the round mansion Thomas English had built on Belle Isle, in the middle of Windermere, in 1774 (Figure 6). Such houses had aroused Wordsworth's ire. In contrast to the 'native' character of the region's cottages, these elaborate buildings were, in his view, 'impertinent' imitations of the grand architecture of other nations.[9] They were, in short, unwelcome imports that 'disturbed' the 'peaceful harmony of form' which had been 'most happily preserved' for so many generations.[10] Ruskin extended this line of thought. These proud buildings, he proposed, might be 'in unison' with the scenery of the Italian countryside, but they did not accord with the simplicity and humility of the rocky landscape of the Lake District (1.94). He expressed this point unequivocally: 'a villa inhabited by an Englishman, no matter how close its imitation of others, will always be preposterous.' (1.95)

Such statements are interesting as indications of the tendencies of Ruskin's early thinking about architecture. What is more, they reveal a good deal about his lifelong attraction to the Lake District and, consequently, his decision to settle in the region towards the end of his days. He purchased Brantwood, his house and estate on the shores of Coniston Water, in 1871. Yet, recalling Ruskin's arguments in 'The Poetry of Architecture' may also incline us to question certain changes he made at Brantwood. When viewed in the light of the uncompromising claims of his youth, some of these changes make one wonder if, in his later years, Ruskin had compromised his standards.

It is important to bear in mind that Brantwood was rather rundown when Ruskin bought it. The house had been built in 1797, and extended in the 1830s

Figure 6. Joseph Farington, 'West view of Windermere, looking over the Great Island'; engraving; 33.7 x 20.8cm; plate 17, Views of the Lakes, &c. in Cumberland and Westmorland *(London: William Byrne, 1789). Image courtesy of the Wordsworth Trust.*

and in 1845. But it had since fallen into disrepair. In the 1870s Ruskin called it 'a mere shed of rotten timber' (29.101), and some commentators have since wondered what it was that Ruskin saw in the building. 'It seems strange,' as Charlie Gere has remarked, 'that one of the great advocates of good architecture should have bought such a mediocre house'.[11] Presumably, he 'wanted it for the view over the lake and to the hills beyond.'[12]

Then again, perhaps something about the dilapidated state of the house and grounds pleased him? As Caroline Ikin has observed, Brantwood's 'humble' appearance certainly did conform with Ruskin's ideals about the cottage architecture of the Lake District.[13] Its 'vernacular materials and functional design' were 'simple in form' and 'subdued in tone'.[14] Was that also part of the property's appeal? It is really hard to know.

What is certain though, is that the house did not remain in disrepair for long. Ruskin soon set to work repairing, improving and transforming Brantwood. And though he did instruct his builders to use local stone in the local fashion (14.386), not all the repairs and alterations he ordered were in keeping with the region's architectural traditions.

Among the most eye-catching additions he made was the turret room he had adjoined to his bedroom (Figure 7). This small but striking extension to the southwestern corner of the house, with its diamond-shaped, latticed

Figure 7. Ruskin's cousin Joan and her husband Arthur Severn, at Brantwood (undated); photographs: Box 7
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windowpanes, furnished Ruskin with an immersive view of Coniston Water and the surrounding fells (Figure 8). His late writings emphasise how dearly he valued the solace and beauty he found in looking on this landscape. 'As I write the[se] words,' he paused to note in 1878:

> I raise my eyes to [the] Coniston Fells, and see them, at this moment imaged in their lake, in quietly reversed and perfect similitude, the sky cloudless above them, cloudless beneath, and two level lines of blue vapour drawn across their sun-lighted and russet moorlands, like an azure fesse across a golden shield. (13.406)

Even today, the room still has the power to enchant. For many visitors to Brantwood, it is one of the highlights of the tour. But as a feature, it is hardly at one with the vernacular architecture of the region. It resembles elements of

Figure 8. Paul Dykes, 'The Turret, Brantwood', photograph, 14 May 2017. Image courtesy of Paul Dykes

the decorative cottages Ruskin had seen among the Swiss Alps (Figure 5) much more than any comparable building in the Lake District.

Nor are the cottages of the Alps the only potential inspiration for the room. Rachel Dickinson, for one, has suggested that we might look for its source in Ruskin's studies of the architecture of medieval Italy. The room might, after all, be compared with the variety of 'outlook aperture', which Ruskin characterised in *The Stones of Venice* as a sort of 'external semi-tower' flanked by 'windows on each side' (9.218).[15] In this case, the turret might be viewed as a counterpart of the lancet windows Ruskin later added to his dining room: both features imbuing the southern side of the house with a certain gothic charm.

But whatever its inspiration was, the turret room at Brantwood certainly does not adhere to the standards laid down in Ruskin's architectural writings. Instead of achieving a 'perfect assimilation' of structure and environment, as

Ellen Frank has noted, the room is an exotic eccentricity that stands out from its surroundings.[16] In short, it is a grandiose addition to what had formerly been a simple building. As a feature, it would appear to imply that 'Ruskin did not rely on his own doctrines.'[17] Along with his other ornate additions to the house, such as the lancet windows, it would seem to make Brantwood, in Ruskin's own terms, as 'preposterous' as the many Lake District villas that preceded it.

How are we to reconcile this apparent contradiction of principles and practice? One answer to this question lies in the contradictory nature of much of Ruskin's work. Many notable artists and writers have made a habit of contradicting themselves. But few have done so as unapologetically as Ruskin. His oft-quoted admission, 'I am never satisfied that I have handled a subject properly, till I have contradicted myself at least three times', springs to mind (16.187). But noting such contradictoriness in its own sake is not enough. Indeed, as this very quotation makes plain, Ruskin's contradictions were often the consequence of his efforts to solve particular problems. What problem, we might ask, was it that he was attempting to resolve in his designs at Brantwood?

Any answer to such a question is bound to be inconclusive. But I do think that we can find an explanation when we pause to reflect on the way Ruskin associated turrets and towers with ideas of enchantment. In the lectures on architecture and painting he gave in Edinburgh in 1853, he has surmised that the words 'turret' and 'tower', like 'pinnacle', 'belfry' and 'spire', made strong appeals to the romantic imagination. 'Have not these words', he asked, 'a pleasant sound in all your ears?' (12.44) The 'strange and thrilling interest' they conjure 'is a most true and certain index that the things themselves are delightful […] and will ever continue to be so' (12.47).

To appeal to one of Ruskin's more well-worn distinctions, such features might be said to possess something of the allure of the picturesque. As he explained in the fourth volume of *Modern Painters*, picturesque elements tend to evoke a sense of the sublime through resemblance or association: 'The essence of picturesque character [lies in] a sublimity not inherent in the nature of the thing, but caused by something external to it' (6.10). The turret room, when viewed in this way, might be seen to recall the sublimity and grandeur of the ecclesiastical and defensive architecture of the Middle Ages. In doing so, the room adds to the visual and imaginative appeal of the entire building.

It cannot be doubted that the turret room adds an air of romance to Brantwood. It is not as outrageously neo-gothic as, say, the towers and turrets of Abbotsford: the country retreat of Ruskin's favourite writer, Sir Walter Scott. But like those towers and turrets, Ruskin's turret room gave Brantwood the appearance of being his own 'conundrum castle'.[18] The enchantment the room was capable of inspiring brought some comfort to Ruskin in his later years, when his health began to limit his ability to go outdoors and his outlook became increasingly bleak. Even in 1883, a year before his famous 'Storm Cloud' lectures, he affirmed: 'I am entirely independent for daily happiness upon the sensual qualities of form or colour', and 'when I want them, I take them either from the sky or the fields, not from my walls' (4.8).

As an addition to his house, the turret room demonstrates a discontinuity between his writings and his deeds. Inasmuch it makes us reflect on whether those writings are really so much a standard for living as they are a wealth of thinking to be further thought-through. Who really is to say? What is clear though, is that whether Ruskin's turret suited its surroundings or not mattered less to him in his final years than the way the room helped him to feel connected with a region he had loved throughout his life. The spark of enchantment it awakened was perhaps enough to rekindle the thrill he had felt for nature in his youth. Here, then, nature and architecture may not be one and the same. But the two are nonetheless held in relationship: the latter leading us into the former.

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This essay was completed between Spring and Summer 2020, when for many of us windows became an increasingly important way of connecting with the world. What the months ahead hold in store remains uncertain, but should you be interested in taking the opportunity to learn more about John Ruskin, then please do visit The Ruskin's website. *Here, you will find information about Ruskin and about our exhibitions and activities. You will also find e-copies of all 39 volumes of the Library Edition of Ruskin's Works. Though over a century old, these volumes still offer a splendid introduction to Ruskin, his works and his world.*

Other books you might find helpful

Dinah Birch (ed.), *John Ruskin: Selected Writings*
(Oxford: Oxford University Press, 2009). Oxford World Classics

This critical edition is an excellent Ruskin 'reader'. It includes extracts from his major works, selected and introduced by one of the greatest living Ruskin scholars.

Suzanne Fagence Cooper, *To See Clearly: Why Ruskin Matters*
(London: Quercus, 2019)

This book offers an engaging introduction to Ruskin's life and works, and it considers the enduring relevance of his ideas for our time.

Francis O'Gorman, *John Ruskin*
(Stroud: Sutton, 1999). Sutton Pocket Biographies

This little biography packs a punch, and it provides a concise and expertly written account of Ruskin's life.

In the same category, you might enjoy:

Robert Hewison, *John Ruskin*
(Oxford: Oxford University Press, 2007). Very Interesting People

For a more in-depth biographical study, you might turn to:

Tim Hilton, *John Ruskin*
(New Haven, CT: Yale University Press, 2002)

Francis O'Gorman (ed.), *The Cambridge Companion to John Ruskin*
(Cambridge: Cambridge University Press, 2015). Cambridge Companions.

This collection of essays, contributed by a range of leading Ruskin scholars and researchers, provides an excellent introduction to a range of subjects relating to Ruskin.

Other noteworthy websites

Brantwood

The Guild of St George

The Elements of Drawing, at the Ashmolean

The Ruskin Collection, at Museums Sheffield

The Ruskin Museum, Coniston

Ruskin at Walkley

Ruskin To-day

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Our Mysterious Frontal Lobes: How they control behaviour in health and disease

TREVOR W. ROBBINS

18 February 2020

One of the greatest challenges for human understanding lies just behind your forehead in the frontal lobes of the brain. Rather than exploring outer space, this essay urges you to do the same for "inner space", i.e. your brain. We are used to the notion that the brain controls our thinking and behaviour and even to the idea that different parts of the brain have different functions, for example, that the left portion or hemisphere controls language in right handed people. Moreover, the phrenologists who liked to think (erroneously) that bumps on different parts of your head might be related to specific attributes or personality characteristics would have been reassured by early studies showing that the rear-most portion of the cerebral cortex, (that mantle of grey matter that comprises much of the human brain) is associated rather specifically with visual function; or even that it was possible to elicit specific memories when stimulating further forward (in the temporal lobe) of the brain during clinical investigations of patients with epilepsy, by the neurosurgeon Wilder Penfield. However, Penfield was notably unsuccessful in evoking many subjective phenomena when stimulating the frontal lobes and for much of the 20th century they were regarded as "silent", mysterious regions of the brain.

Some of that mystique undoubtedly came about from the strange case in the 19th century of Phineas Gage. Gage was a 25 year old American railway worker, of "temperate habits and possessed of considerable energy of character", who unfortunately had a bizarre accident when working in Vermont. Whilst clearing ground with explosives to lay railway tracks, he managed to blow, clean through his head, a large tamping iron, which landed some 25 metres away "smeared with blood and brain". Gage was thrown off his feet and rendered unconscious with convulsions, so there must have been serious doubts as to his ultimate well-being, However, somewhat miraculously, he recovered within 30 minutes of the trauma "despite an effort of vomiting about half a teacupful of brain". His subsequent physical recovery over about 4 years was rocky but not marked by any truly profound intellectual deficits.

In some sense, this observation of miraculous recovery may have provided support for any notion that the frontal lobes played little role in behaviour, as it became clear from later reconstructions of Gage's skull (now displayed in a medical museum in Boston) that the tamping iron had entered around the orbit (or eye-socket) of the left eye and must have decimated much of the frontal lobes, particularly those regions behind the orbit (which anatomists,

rather unimaginatively, label as "orbitofrontal cortex"). But Gage was somewhat affected by his traumatic lesion. According to his chronicler John Harlow (1848), an opinion was voiced by his friends "that Gage was no longer Gage". His entire personality had been greatly altered by his brain lesion. Formerly social and hard-working, he became truculent and obstinate, yet vacillating, and profane. Nevertheless, (and against much popular distortion and exaggeration of the extent of his personality change) Gage did largely recover and he held down two further jobs in the remaining 12 years of his life, including driving a stage-coach in Valparaiso, Chile. Hence, the implications from Gage's case for 'locationalist' views that the frontal lobes had specific functions, even in the vague domain of personality, remained somewhat obscure.

In fact, 13 years after the publication of the curious case of Gage, another patient study showed a clear, and rather specific role for the frontal lobes in language. The French neurologist Paul Broca discovered a patient who had had a stroke blocking the middle cerebral artery that produced a profound disability to express spoken language, with the exception of the repetitive utterance "tan-tan". The identity of this patient was initially kept secret and so he is referred to as Monsieur "Tan-tan". On post-mortem, Broca observed damage to part of the frontal lobes in the left hemisphere ("Broca's area", see Figure 1), although modern studies have shown that the damage was more wide-spread. Tan-tan's problem was thought to be not so much an inability to comprehend language, or to a problem in motor workings of the larynx per se, but instead to a devastating problem of sequencing and articulation, called motor or "Broca's" aphasia. (in fact, Tan-tan had language problems that were much more general and referred to today as "global aphasia").

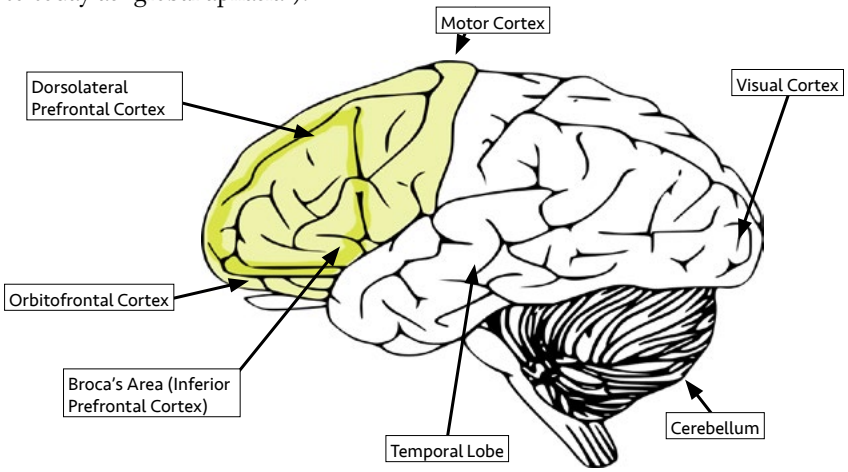

Figure 1: The human brain, side-view to the left cerebral hemisphere, showing the frontal lobe (shaded) as one of the main components of the cerebral cortex. Also to be observed is the brain stem and the underlying cerebellum

This famous case later became a major pillar of support for an entire theory of the neural basis of language, which is beyond the scope of this article. In fact, the precise theoretical significance of case histories such as this for a range of questions, including the localization of cognitive functions in the brain, is not always clear. Nevertheless, other cases, including those involving famous individuals, have shown that the phenomena of strokes affecting the frontal lobes supports Broca's original observations. Thus, the author of *Les Fleurs du Mal*, Charles Baudelaire, suffered a stroke that left him stereotypically repeating the mild profanity "crénom" ("holy shit") to each and everyone, whilst otherwise being more or less in control of his faculties. Similarly, the Russian revolutionary Vladimir Ilyitch Ulianov (Lenin) was reduced after his stroke to the expression "vol-vol" in virtually all his conversations. Lenin donated his brain to a research institute which examined its structure in some detail post mortem; again, damage as a consequence of his cerebro-vascular disease was more widespread than a specific focus in the left frontal lobe and so it was also difficult to draw strong conclusions. However, from these famous clinical case histories, we could tentatively conclude that the frontal lobes confer upon us the capability of fluency and flexibility in some aspects of behaviour.

The cellular building blocks of cognition

Studies of individual patients can lead us to fascinating conclusions about brain function, but as we have seen, the arbitrary interventions by fate or nature inflicted upon us seldom provide the precision we require for modern neuroscientific understanding. More can be revealed by using techniques that record or stimulate the brain with great resolution, in carefully defined functional contexts. One clear fact emerging over the last 50 years is that the frontal lobes have considerable heterogeneity, and in fact comprise as many as 20 distinct regions, on both left and right sides of the brain. These regions are defined in part on the basis of their differential connectivity to other brain regions, whether to other regions of the cerebral cortex or to regions in the sub-cortical brain. These sub-cortical regions consist of collections of nerve cells, called nuclei, which have specific basic functions. For example, the cerebellum, as diagrammed in Figure 1, controls locomotion, and another sub-cortical structure, the striatum (not shown in Figure 1, but buried beneath the frontal lobes) controls learned actions.

This connectivity is enabled along so-called white matter tracts, which are essentially the cables along which they communicate. Today, these tracts can be visualised using a technique involving magnetic resonance imaging in a brain scanner. Their metabolic activity can also be recorded as a proxy index of their neuronal activity. This mapping of neural networks of the brain is called connectomics; interestingly, a schematic of this map, like that of the London Underground, looks very different from its anatomical representation!

Additionally, the regions themselves have distinctive "grey matter", which consists of different types of nerve cell (neurons) as well as other supporting cells. In the early parts of the 20th century, the Spanish Nobel Prize winner

Ramón y Cajal had invented and implemented methods, including stains and tissue fixation, for observing neurons microscopically and determining how they appeared to participate in neuronal networks (see Figure 2). These interactions, which earlier work had strongly indicated occurred via electrical conduction, did not however include direct physical contact; Cajal observed minute gaps between nerve cells, which were later called synapses by the Liverpudlian Nobel Prize-winner Charles Sherrington (Figure 2). How did the electrical nerve impulse then pass across the gap? Eventually, Nobel Prize researchers, such as Henry Dale, discovered and characterised chemicals, called neurotransmitters, which were released by neurons when active and diffused across the synaptic gap to convey the message from the pre-synaptic neuron to the post-synaptic cell. Many psychoactive drugs work by acting on these neurotransmitter mechanisms. For example, the drug of abuse, amphetamine, enhances the level of two such neurotransmitters, dopamine and noradrenaline, in synapses of several brain regions, including the prefrontal cortex. These chemical messenger systems, which arise from nuclei in the sub-cortical brain, appear to mediate many of the general states of being under which we (and our prefrontal cortex) operate. For example, they are especially active in states of alertness, motivation (or 'reward'), and stress.

A. B.

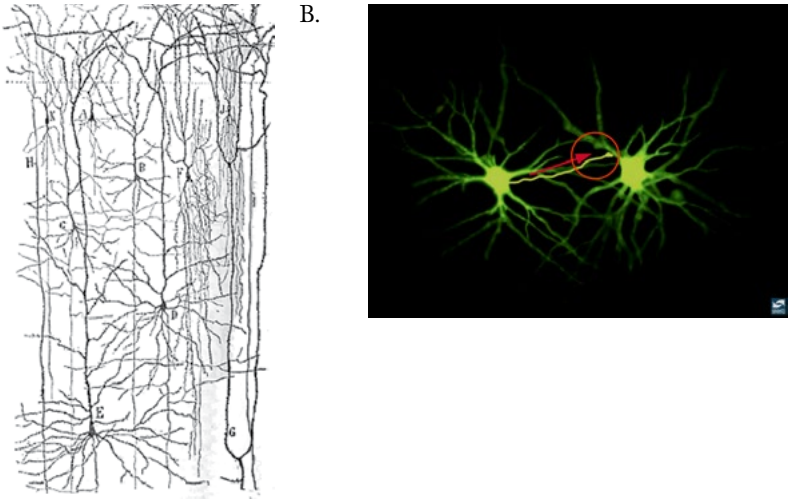

Figure 2: A. Cajal's drawing of neuronal networks in the prefrontal cortex of the human brain, from Histologie du Système Nerveux de l'Homme et des Vertébrés B. Location of a synapse connecting two nerve cells or neurons.

The different regions of the frontal cortex thus differ in their connectivity, cellular structure ('cytoarchitectonics') and chemical characteristics - presumably adapting them for different functions that hypothetically represent some of the building blocks of higher cognition. Evolutionary considerations show that the frontal lobes of non-human primates such as the chimpanzee, rhesus monkey

and marmoset share much of the general organization of these different human frontal lobe sub-regions. Even the laboratory rat or mouse has some areas in greatly reduced form that may be related to the human frontal lobes. These occupy about a third of the human cerebral cortex (but a smaller proportion for the rodent). When discussing the human frontal lobes, we generally distinguish those areas at the back of the frontal lobes that have obvious motor functions ('motor cortex') from the enormous prefrontal cortex, at the very most rostral (i.e. frontwards facing) extent of the brain. (Figure 1). The term "prefrontal cortex" is perhaps somewhat confusing and illogical, as it implies that cortex in front of or before the frontal cortex. However, all it really means is that part of the frontal cortex which is not part of the motor cortex (and its associated motor areas) which also lies within the frontal lobes (Figure 1).

Executive functions of the prefrontal cortex

The vast degree of inter-connectivity of the prefrontal cortex with the rest of the brain, including not only to other regions of the cerebral cortex, but also to nuclei in the sub-cortical brain, suggests that it has an important supervisory or executive function. At the apex of a hierarchy, it nonetheless maintains communication with all levels of the brain - presumably 'listening in to conversations" or even directly influencing functioning in other nuclei. By executive functions, I define this to mean that set of functions that serve to co-ordinate and optimise the component processes that are engaged by complex tasks. How does one begin to measure such complex functions in the human experimental psychology laboratory? One method is to devise tests that emphasize different features or building blocks of higher cognitive function, observe their relationships to a global measure of intellectual performance such as an IQ test, and then relate them to the functioning of the prefrontal cortex. One such study has identified three major building blocks which I will describe as working memory, cognitive flexibility and inhibitory response control.

Working memory

Working memory refers to the ability not only to hold, but also manipulate, information in consciousness, so as to guide future plans and goal-directed behaviour. This information could be in verbal or visuospatial format. It is not quite the same as short term memory, although they are related. A common test of short-term memory is to repeat the digits to yourself of a telephone number you have just looked up in the directory. (Most people can remember immediately about 7 digits without too much difficulty). But working memory is a somewhat more complex process; the test it would require is that you could recite the numbers backwards having heard the sequence once, for example. Getting this right might require you first to rehearse silently the initial sequence (e.g. "365878") in your head. This kind of verbal rehearsal plays an important part in many of our intellectual endeavours. For example, if you simply repeat the word "the" aloud during a 'true-false' logical reasoning task, this has a devastating effect on performance. Our research group at Cambridge was also

able to show that blocking a verbal rehearsal mechanism in this way had little effect on the solution of chess problems. However, merely tapping out a simple spatial sequence was shown to be detrimental, showing that chess uses that part of working memory based on visuospatial, rather than verbal, codes. Tests of working memory ability tend to correlate highly with IQ performance and also depend critically on certain regions of the frontal lobes, such as the dorsolateral prefrontal cortex (Figure 1).

A test of visuospatial planning that has often been used in tests of frontal lobe function is the "Tower of London" which involves working out in your head a series of moves of tokens to get to a 'goal position', rather like chess problems. This form of planning has been shown by ourselves and others to depend on functions of the frontal lobes from studies of brain damaged patients, and also healthy volunteers doing the computerised Tower of London task in a brain scanner. The latter shows that when the participants engage with the task there is an activation of specific portions of the prefrontal cortex in association with a circuit including the dorsolateral prefrontal cortex, that mediates visuospatial working memory.

Further evidence at a cellular level has been provided by studies in animals. Monkeys are adept at working memory tasks where they simply have to remember the locations of rewards such as peanuts by moving their eyes to an appropriate point in space. Recording the electrical activity from individual nerve cells in the dorsolateral prefrontal cortex indicates that they are capable of holding 'online' the information about this location after a delay that interferes with its memory.

Cognitive flexibility

One of the vital functions of the prefrontal cortex is to respond to change in environmental circumstances; altering behaviour so as to maximise reward and avoid disaster. This function of cognitive flexibility is captured by a number of tests in the neuropsychological laboratory, including the so-called Wisconsin Card Sorting Test (WCST). The WCST requires subjects to sort cards with symbols that vary in a number of ways, including the colour, shape and the number of symbols on each card. The cards may be sorted on the basis of trial and error in accordance with an arbitrary rule imposed by the psychologist, for example, by colour. Having learned to sort cards in this way according to trial-and-error verbal feedback ("right", "wrong"), the rule is suddenly changed and the participant has to learn the new rule (e.g. sorting by shape). A striking discovery in the 1950s by Dr Brenda Milner (a native of Manchester and an undergraduate at Cambridge) working at the Montreal Neurological institute, was that patients with frontal damage, caused for example, by strokes or surgery (for tumours or epilepsy), had difficulties, not in learning the original rule, but in shifting away from it. Hence, they continued to use their old strategy even in the face of negative feedback and being aware that they were now in error. The WCST is also sensitive to traits in the normal, healthy population. Intriguingly, we found in a recent large Web-based study that performance on this same

test of cognitive flexibility was associated with Brexit-related sentiments; those individuals adhering to nationalistic and related viewpoints turned out to be less flexible in cognitive terms, according to their WCST performance (although they were matched in terms of general intelligence with 'Remainers'). Thus, this executive function of the prefrontal cortex evidently contributes to the maintenance of everyday attitudes.

Performance of healthy volunteers on tests of cognitive flexibility is less strongly related to IQ than is working memory; intriguingly, studies of twins also indicate less genetic heritability than for working memory. Using our computerised test of cognitive flexibility in conjunction with brain scanning in healthy volunteers, we have shown that the capacity for cognitive shifting is associated with the functional connectivity of another prefrontal cortex pathway, with the striatum of the sub-cortical brain. Additionally, we have shown that patients with obsessive-compulsive disorder also exhibit cognitive rigidity in performing this task and less activity in this same prefrontal cortex-striatal pathway.

Obsessive-compulsive disorder (OCD) is a severe, disabling disorder that can result in individuals thinking continually about their obsessions and repetitively performing motor compulsions (such as hand-washing or checking) for many hours in the day, to their evident detriment. Some historical figures have resisted OCD symptoms and managed to have successful lives such as Martin Luther, Samuel Johnson, Charles Dickens, the film-magnate Howard Hughes and Hans Christian Andersen.

One of the guiding principles in our research is that the study of frontal lobe function in healthy, as well as brain damaged, people will help us to understand better neuropsychiatric disorders such as OCD, but also ranging from schizophrenia and drug addiction, to some forms of dementia, every one of which seemingly implicates dysfunction of some aspects of the prefrontal cortex and its associated circuitry. This is useful for a number of reasons; first of all, it helps in the diagnosis of specific mental health problems. Secondly, it gives us a target for intervention, whether this is via a biological treatment such as drug, or a psychological treatment, a software-like solution, which may help to re-instruct the prefrontal cortex.

Inhibitory response control

Another key executive function is the capacity to inhibit behavioural output when this is maladaptive. Impulsivity can be a good trait to have when action is imperative. However, it can be a curse when it is premature or unduly risky. Many psychiatric disorders, including addiction and compulsive gambling may derive from impaired inhibitory control. An especially good developmental example is attention deficit hyperactivity disorder (ADHD) which results in problems of attention and learning in both children and adults, as well as excessive impulsive behaviour. Again, there are sensitive laboratory tests that can detect impulsivity and can be used to identify the role of the prefrontal cortex and pharmacological interventions designed to reduce impulsive tendencies. We used a task that

requires subjects suddenly to cancel a motor action to an urgent "stop!" signal, in a large functional magnetic resonance study of some 2000, 14-year-old adolescents. Several neural networks involving the frontal lobes were engaged that were different from those involved in the planning task above. Notably, these included on the right side of the brain, that part of the inferior prefrontal cortex which corresponds to Broca's area in the left hemisphere. Instead of having roles in the sequencing of utterances, the right-sided region appeared especially important for impulse inhibition. Drugs used to treat ADHD include Ritalin (an amphetamine-like stimulant) and atomoxetine, which mainly increases noradrenaline levels in synapses. True to form, atomoxetine does improve stopping performance, both in ADHD patients and in healthy volunteers. Moreover, it does so by enhancing the activation in that inferior, right-sided region of prefrontal cortex.

The orbitofrontal cortex and decision-making

The co-ordination of the three main executive functions described above, of working memory, cognitive flexibility and inhibitory response control, together underpin effective decision-making, which I define as selecting the optimal response or plan from amongst the current options. However, appraisal of what is optimal requires the identification of the goal or purpose of the activity, as well as its emotional (e.g. rewarding) concomitants and this representation of the goal is the central requirement of effective decision-making.

Another region of the prefrontal cortex, the orbitofrontal cortex (that part of the brain just behind the eye-sockets) (Figure 1) is responsible for what we often define as "hot" aspects of cognition, including goal representation, to contrast with the triad of "cold" executive control mechanisms. It is well served in this role by those chemical messenger systems that convey 'reward' or, alternatively, aversion, including the dopamine and serotonin messenger systems.

The neurologist Anthony Damasio has made a special study of those patients suffering from damage to the orbitofrontal cortex, many of whom he considers may be modern versions of Phineas Gage. Some of these individuals did much worse than Gage, getting divorced, becoming bankrupt and addicted. Patient EVR, for example, repeatedly made disastrous decisions and yet was relatively unimpaired in basic aspects of intellectual function such as IQ and working memory. One kind of test for which such patients did exhibit profound deficits was the Iowa Gambling Task.

This test requires the subjects to play with 4 decks of cards which are associated with different levels of probabilities of reward or punishment ('points' won or lost). Two of the decks ("A" and "B") have large rewards associated with them but also catastrophic occasional punishments, sufficient to 'bankrupt' the individual. The other two decks ("C" and "D") have much smaller but steady earnings of reward, but much rarer, smaller punishments. Hence, upon playing the game over a long period it makes sense to select card decks C and D rather than A and B, and this is what healthy volunteers universally do. However, patients with damage to the orbitofrontal cortex tend to stay with decks A and B,

inevitably resulting in 'bankruptcy." The brain-damaged subjects are seemingly oblivious of the disastrous possible consequences of their risky behaviour. Healthy volunteers appear to develop a 'hunch' or a 'gut feeling' that card decks A and B are bad that is coincident with measures of skin conductance caused by perspiration. However, the patients with lesions do not develop this bodily warning signal and makes them vulnerable to the risks entailed or sensation-seeking. Damasio has speculated that such patients have lost a 'somatic marker' from the body that is not properly integrated into the decision-making circuits of the prefrontal cortex.

Our own computer-controlled "Cambridge Gambling Task" asks similar questions about decision-making but does not require the subjects to learn rules about reward and punishment; the odds are presented graphically and rather explicitly for participants to make bets about their choices. Patients with orbitofrontal damage still bet significantly more of their points on the correctness of their decisions even than patients with damage to other regions of the prefrontal cortex, - while also making poor decisions. Groups of drug-addicted individuals to stimulants such as amphetamine and cocaine, and also to heroin, also exhibit poor decision-making, probably due in some cases to toxic effects of such drugs on the orbitofrontal cortex. Additionally, healthy individuals who had volunteered to deplete themselves temporarily of the essential amino-acid tryptophan also had deficits in decision-making. This dietary treatment produces small, transient reductions of the neurotransmitter serotonin which provides an important influence over prefrontal cortex functioning. Indeed, patients with depression, who are often treated with drugs such as Prozac, which boosts serotonin levels, also have problems with decision-making.

Relevance to the complexities of everyday life; enterprise, moral reasoning, and political hubris

Gambling decisions in the laboratory are not too distant from the kind of decisions, weighing up pros and cons, that one continually has to make in everyday life; for example, the temptation to take a tasty food reward that is immediately available versus a healthy food which has long-term benefits. Risky decision-making is an important part of business entrepreneurship and particularly of venture capitalists. in fact, there is evidence using the Cambridge Gambling Task that successful entrepreneurs are more likely to make risky decisions than general managers (a suitable control group), matched for IQ. However, one reason why entrepreneurs do not perform like patients with orbitofrontal damage is probably because they have superior powers of cognitive flexibility. When things look dangerous, they are able to take swift evasive action!

Another important form of decision-making is in the moral domain. For example, the notorious "trolley problem" poses the dilemma of what one would decide in order to limit life loss caused by a run-away trolley car. By making a rapid decision to switch the points one could deflect the trolley from hitting 5 pedestrians to only one. This is often referred to as a utilitarian decision and brain

imaging studies highlight those regions of the prefrontal cortex implicated in 'cold' reasoning. By contrast, if one is asked to consider the deliberate intention to push someone into the path of the on-rushing trolley, so as to save the 5, the more emotional ("hotter") regions are engaged, including the orbitofrontal cortex. Here, the active intention to kill or cause harm to an individual is to be contrasted with the collateral damage that occurs in the other scenario, that can be attributed to accident or side-effect, rather than assuming the full emotional responsibility for what is effectively homicide.

In general, social cognition, involving rumination on one's own states and self-image, the thoughts of others and how they may relate to you, appears to engage those portions of the prefrontal cortex in the midline of the brain, where the right and left hemispheres meet (the medial prefrontal cortex). The prefrontal cortex therefore importantly interacts with those neural networks that comprise the 'social brain'.

All of these capacities for decision-making come together in the duties of political leaders. As we only know too well in the present context, science can provide data, (as can our sensory organs), but advice has to be acted upon, with real decisions. Lord David Owen, the one-time U.K. Foreign Secretary (1977-79), has been highly critical of the decisions sometimes made by our leaders, postulating that "power corrupts"- in other words that the longer in power, the worse is the decision-making. He defines this as an acquired psychiatric syndrome, 'hubris', diagnosed with a collection of contributory symptoms, which include narcissism (elevated sense of self-value), exaggerated self-belief, excessive confidence, reluctance to take advice, except from a highly selected group, restlessness, impulsivity and a degree of cognitive inflexibility. He applies this theory to a group of former US Presidents and UK Prime Ministers.

One wonders what possible role might be played by the prefrontal cortex in this syndrome, given its malfunction in many other psychiatric disorders that lead to poor decision-making. One possible clue is the susceptibility of the prefrontal cortex to stress, mediated by those chemical messenger systems, including serotonin, dopamine and noradrenaline, as they become overactive. The very act of making highly scrutinised, complex decisions of national and international importance for a political leader over an extended period may simply be too much for the prefrontal cortex to bear, and hence it becomes dysfunctional. At any rate, it does behove us to pay special attention to the longevity of political appointments.

In this review, I have tried to provide a glimpse into how the brain works from the perspective of its most intricate piece of machinery, the prefrontal cortex. As will hopefully have become apparent, this is not a single structure or body, like a 'little man in the head". It consists instead of different subregions that, like an executive committee, have to co-operate and collaborate in making the optimal decisions for the individual. Moreover, it has to attend, not only to environmental change, but also to signals coming from the body and the sub-cortical brain in order to "only connect" the rational with the visceral, and 'cold' with 'hot' cognition, and thus influence behaviour.

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The Challenges and Opportunities of an Ageing World

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Introduction

The world is ageing – both at an individual and population level – and this ageing produces challenges and opportunities for governments and citizens across the globe[1-5]. This age-structural change is fundamentally changing the world in which we live[6] presenting both challenges and opportunities for us as individuals, for our families and for our communities.

At the same time, the world is urbanising, with more and more people living in urban settings[7]. In 1950, 70 per cent of people globally lived in rural settlements and just 30 per cent in urban settlements. By 2014, 54 per cent of the world's population lived in urban settings and the urban population of the world is expected to continue to grow, so that by 2050, 68 per cent of the world's almost 10 billion inhabitants will be urban dwellers[8]. Again, this presents challenges and opportunities.

Individual and population ageing

At an individual level, life expectancies at birth have increased from 47 years in the mid-20th century to 70 years today, and are expected to rise to 78 years by the mid-21st century. At the population level, the proportion of the world's population aged 60 years and over has increased from 200 million and 8 per cent of the total population in the mid-20th century to almost 1 billion and 11 per cent, and by 2050, it is expected to reach 22 per cent, equating to 2.1 billion people[9]. The challenge of this increasing longevity has long been an issue of demographic interest, and no less so in more recent years[10-12].

Clearly, the scale of global ageing at both the individual and population level is unprecedented and unlikely to cease in the immediate decades of the 21st century, but this is a story of success as more and more people live long, relatively healthy lives[10-12].

However, this population ageing process is not uniform across the world, nor is it uniform across regions of the world or even within countries of the world. The experience of demographic ageing can differ significantly across and within countries. The ageing of European populations began with the classic demographic transition characterised by a transition from high fertility and mortality to low fertility and mortality with mortality declining first of

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all leading to explosive population growth before fertility begins its continual decline leading to a slowing and eventual cessation of population growth (for example, ref. 13). This transition lasted for around 150 years giving societies and governments time to address and adjust as their populations transitioned from young to old. The infrastructures in place in the advanced economies of the world today such as long term care services, housing and transport, and pensions systems, for example have been developed accordingly in response to changing demographics and levels of welfare. More recently in the transitional economies of the world, this same demographic transition has got underway and is not only more dramatic in terms of scale, but also in terms of speed (for example, ref.14). This leaves governments and societies in these economies with little time to address and adjust and their window of opportunity is closing slowly but surely.

By the mid-20th century, population ageing was rooted in Europe and North America 15 while elsewhere youth still dominated the demographic stage. Even so, developments and levels of change differed across the regions of the world.

The populations of Europe and North America aged through the 20th century and for these economies the future holds one of extremely low levels of fertility and radical life extension[16,17] while at the same time the populations of much of Asia will age on an unprecedented scale, driven primarily by rapidly declining fertility[12,18]. Fertility in the Republic of Korea, for example, has declined in the course of just one generation from 2.92 in 1975-80 to just 1.26 in 2010-15[9]. This presents challenges to individuals, families, and society as a whole, not least because many of these societies rely heavily on the family in respect of support for older people, while these traditional structures may be under pressure as the modern family changes (for example, ref.19). The nuclear family is shrinking dramatically and the role of the family is changing likewise[20].

As we move into the 21st century, the populations of Latin America and the Caribbean, with their own history, culture and traditions, will begin to mirror this ageing, and countries are variously prepared or unprepared to take on the challenge[21,22].

This will leave Africa as the final continent of youth – but for how long? In 2015, just 3.5 per cent of Africa's population of 1.2 billion were aged 65 years and over. By 2050, this will have increased to 6 per cent of 2.4 billion, and by the end of the 21st century, the figures will have reached 14.3 per cent of 4.4 billion.

As families, we are having fewer and fewer children. Fertility across all regions of the world declined from 1950 levels ranging from 6.6 in Africa to 2.7 in Europe to 2015 levels ranging from 4.7 in Africa to 1.6 in Europe. This downward trend is expected to continue to 2050 everywhere except Europe and Northern America, which are expected to experience relatively modest increases in fertility. By 2050, only Africa is expected to have fertility levels still above replacement level (at 2.9 for the continent as a whole). Such dramatic declines in fertility present huge challenges to individuals, to families, and to society as a whole, not least because many of these societies are largely family-based in respect of support.

So, the world is ageing – both at an individual and at population level – and this demographic development produces both challenges and opportunities for governments, communities, families and individuals across the globe. While increases in longevity and life expectancy relate to our individual ageing, the declines in mortality and fertility relate to age structural change (population ageing), a situation in which the number of older people and their share of the population increases.

United Nations data[9] reveal that for the first half of the 20th century, the populations of the different regions of the world were not that old, with the proportion of population aged 65 years and over ranging from 3.2 per cent in Africa to 8.2 per cent in North America. Not until 1970 did we see any region attain more than 10 per cent of its population aged 65 years and over (Europe at 10.5 per cent). In fact, North America (12.3 per cent) and Europe (14.7 per cent) were the only regions at the end of the 20th century to have more than 10 per cent of their populations aged 65 years and over. By 2015, Oceania (11.9per cent) has joined the aged regions of the world, but elsewhere proportions aged 65 years and over remain below 10 per cent, with Africa having increased only modestly from 1950 to 2015 to 3.5 per cent of its population aged 65 years and over. The next 35 years or so are predicted to witness dramatic increases in the number and proportion of older people in all regions of the world outside Africa. By 2050, almost 28 per cent of Europe's population is expected to be aged 65 years and over, followed by North America (almost 23 per cent), Latin America and the Caribbean (almost 20 per cent) and Asia (18 per cent). Africa will still have only 6 per cent of its population aged over 65 years.

Fertility – levels of childbearing – is a major driver of age structural population change and unsurprisingly therefore understanding the dynamics of fertility has generated a large amount of research. It has been argued that the patterns of economic development across the 20th century led to a century of more or less uninterrupted fertility decline, the argument being that this economic development had increased both the socially constructed costs of children and the opportunity costs of responsible parenthood. In the 1970s to 1990s, the baby-bust levels of fertility (1.3 to 1.8) across Northern and Western Europe and North America were unprecedented (and not expected to remain at these levels) but elsewhere in the world, levels of fertility remained high and the world's population was expected therefore to reach 12 billion by the middle of the 21st century. In fact, what happened in the following decades was that fertility levels did remain low (or increased only moderately) in Northern and Western Europe and North America; even declined to much lower levels in Southern Europe; and declined dramatically in Asia, coming down by the end of the 20th century to extremely low levels in some countries such as the Republic of Korea (around 1.2), Hong Kong (around 1.0) and Singapore (around 1.3)[9].

Mortality is the other major driver of age structural population change. Life expectancies have been increasing steadily since the turn of the 20th century, but what has been particularly striking is the improvement in survival at older ages and there is an increasing body of evidence that lives will continue to be extended for some time to come.

The first half of the 20th century saw life expectancies at birth for both males and females in the more developed world increase by around 20 years. In absolute terms, it will take 100 years from 1950 to 2050 to increase these life expectancies at birth by another 20 years. This is driven by a shift in mortality declines from the young to older age groups, reflecting the demographic reversal of the earlier conviction that mortality at older ages is intractable. Indeed, declines in mortality among the extreme aged have been noteworthy and improvements albeit more modest have also occurred in the second half of the 20th century[10,11,22]. Around the world, new generations can expect to live longer than previous generations, and the rate of increase is surprisingly strong and constant. Life expectancies at birth for both sexes combined have increased at the global level from around 47 years in the mid-20th century to around 70 years today, and are expected to rise to around 77 years by the mid-21st century. In Europe, for example, these life expectancies have increased from 64 years in 1950 to around 76 years today, and are expected to reach around 82 years by the middle of the 21st century.

Much of these improvements are related to a shift from mortality from infectious diseases to mortality from non-communicable diseases. The population forecasts assume continuing declines in mortality in all regions of the world and in addition, the developed – developing country differences are expected to decrease so that by 2050, life expectancies at birth for males range from 69 years in Africa to 84 years in Northern America, and from 73 years in Africa to 86 years in Northern America for females.

But we are also entering an era of extremely long lives around the globe. This is destined to be the century of centenarians[17]. Centenarians are nothing new, although verifiable ages at death are increasingly difficult to identify pre-19th century as records were unreliable even if they existed. Across much of the globe, centenarian populations have increased from "handfuls" to thousands as mid- and late and extreme late life mortality have all decreased. The numbers of centenarians for example in England and Wales, Sweden, Japan and France in the 1930s and until the late 1940s were between 40 and 220, but from the early 1950s the numbers in England and Wales and in France began more or less doubling every decade.

By the turn of the next century, life expectancies at birth for Europe as a whole are predicted to be 87 years for males and 91 years for females which will lead to increasing numbers of people at extreme ages, including centenarians.

In England and Wales, for example, the number of centenarians will increase steadily across the 21st century from just over 12,000 in 2012 to perhaps 1.4 million by 2100. But consider a scenario in which projected mortality for those aged 55 years and over decreases by an additional 5% every 5 years in relation to the official projected mortality fuelled by potential additional decreases brought about by medical advances such as stem cell therapies enabling 80-year olds to live to 200 years of age[23]. The number of centenarians in England and Wales by 2100 would then reach around 1.8 million.

Our urbanising world

If ageing is a major demographic issue of the 21st century, urbanisation is the second major issue. The world is becoming increasingly urbanised with more and more people living in urban settings. According to the United Nations[8], in 1950, 70 per cent of people globally lived in rural settlements and just 30 per cent in urban settlements. By 2014, 54 per cent of the world's population lived in urban settings and the urban population of the world is expected to continue to grow, so that by 2050, 68 per cent of the world's almost 10 billion inhabitants will be urban dwellers. All regions of the world will continue to urbanize with the most rural regions of Africa and Asia urbanizing faster than elsewhere – their urban populations reaching 56 and 64 per cent of their total populations, respectively, by 2050. Although the share of the global population living in rural areas has declined, the absolute size of the global rural community has grown and is expected to peak in the near future. Currently, the global rural community amounts to almost 3.4 billion people.

The global urban community has increased in size almost five-fold from 746 million in 1950 to 3.9 billion in 2014. Asia has modest levels of urbanization as a region, but it is home to 53 per cent of the world's urban community. This compares with Europe's 14 per cent. Population growth and urbanization are predicted to continue into the 21st century, bringing an additional 2.5 billion people to the world's urban community by 2050, with nearly 90 per cent of this concentrated in Asia and Africa. Strikingly, three countries alone – namely India, China and Nigeria – are together predicted to account for 37 per cent of this projected growth in the world's urban community between 2014 and 2050, with India adding 404 million urban dwellers, China 292 million and Nigeria 212 million.

Discussion

Why then is age structural change so important? It is important to adopt a multi-pillared approach to tackle the issues raised by age structural change, ranging from pensions and health and social care to transport and housing, all of which to some degree will apply to all nations of the world as we move deeper into the 21st century. These demographic changes impact and will continue to impact across societies around the world. Growing old in societies dominated demographically by young people is fundamentally different from growing old in societies dominated demographically by older people. There are implications for individuals with respect to planning for old age; for families comprising more and more generations; for communities with increasing numbers of extreme aged people needing care and support; for workplaces short of younger skills. And governments will need to rethink how public services are planned and delivered across all government departments. These global age structural changes will everywhere require a co-ordinated response across government in order to reflect the inter-connectedness of policies affected by the ageing of populations.

Unless there are significant improvements in health as we move deeper into the 21st century, population ageing will increase the amount of ill-health and disability. Globally, chronic conditions, multi-morbidities, and cognitive impairments will become more common and in societies where the family plays a pivotal supporting and caring role, family members will at the same time face increasing pressure to balance this role with other work responsibilities. There is therefore a danger going forward that demand and supply of care will diverge, as more and more people need support (also financial support) while the pool of (younger) workers decreases and families feel the strain.

Population ageing brings with it an ageing workforce. In the more developed economies of the world, productivity and economic development will be increasingly linked to the ability to retain and reskill older workers. Retaining and reskilling older workers for longer will enable societies to support the increasing numbers of older dependents. At the same time, work beyond traditional retirement age will become an increasingly important pillar of financial security in old age. Radical changes to our workplace mentality will be fundamental to the economic wellbeing of societies and populations in the 21st century.

Lifelong learning, training and re-training will become important as populations age as this will allow us to remain active in the workplace and community, which in turn will enhance individual health and wellbeing. Our homes will play a major role in our future lives, and not just as places to live. Our homes will become places of work, play and care, and appropriately designed and adaptable housing will similarly enable us and contribute to our health and well-being as we age.

The question is whether population ageing is a particularly good or a particularly bad development. Causes for concern are linked to the ability of societal infrastructures to accommodate changes in age structures, in this instance the transition from a predominantly young world to a predominantly old world. This demographic development is clearly a challenge to current concepts of old age and therefore most importantly, perhaps, we need to redefine old age.

Harper[24] discusses the reformation of ageing and old age and argues, amongst other things, that we are attempting to tackle the 21st century phenomenon of extremely long lives with 20th century institutions. In this context, it is pertinent to consider how old age is defined and how ageing became interesting 25 in order to redefine old age in light of our potentially and likely very long lives.

Towards the end of the 16th century, Shakespeare provided us with the seven ages of man in his play *As You Like It*, and it is the last scene of all that defines old age for centuries to follow, a return to childhood and a time of total dependency.

> "… Last scene of all,
> That ends this strange eventful history,
> Is second childishness and mere oblivion,
> Sans teeth, sans eyes, sans taste, sans everything."

However, in modern times, Shakespeare's 5th and 6th still active ages of man are packaged into old age along with the 7th age.

But more determinate than even Shakespeare is the fact that there are three institutional structures which historically defined older people as a separate group from everyone else in a population. These three structures are almshouses* the pensions systems introduced increasingly in Western Europe from around the end of the 19th century, and the development of geriatrics as a medical specialty.

From the 18th century, almshouses developed from institutions for poor disadvantaged of all ages to institutions populated by older people, which meant that the group of (all) older people becomes homogenised into this group. Almshouses institutionalised a marginalised social space for older people.

Pensions systems introduced a marginalised social time defining old age. They define an exact age beyond which individuals become dependent, separated from the younger productive section of the population. In this way, a well-defined phase of life called old age becomes anchored in society's judicial and administrative structure. A collective perception of old age as a well-defined, chronologically determined phase of life appears from the middle of the 19th century. This opens the floodgates for a standardised definition of old age based on statistical probabilities, and along with this comes the opportunity to treat and understand older people collectively as a group in a chronologically well-defined phase of life. This statisticalisation of old age provides a scientific platform for the introduction of social support mechanisms in old age.

The medicalisation of the ageing body/person comes with the birth of geriatrics as a discipline around 1840. The medicalisation of ageing – helped by the marginalisation of old age and older people – led to the dominant image of ageing and old people as one characterised by the tired, failing ageing body. The 7th age of man described by Shakespeare as second childishness fitted this image perfectly.

The early retirement schemes of the 1970s and 1980s in Europe and North America, introduced to create jobs for the unemployed youth, redefine the collective perception of and attitude to old age dramatically. This is a redefining of the space and time of old age.

The issue now is that someone aged 60 years is expected to join the collective ranks of old age, slotting neatly into the stereotypical image of old age built up over the previous 150 years or so.

Given increasing life expectancy and longevity, individuals potentially have the opportunity to contribute to their families, communities, and workplaces for much longer – breaking through the legislative and administrative age barrier that constrains them and redefining old age in the life course. This is the potential of ageing. It is about extending our active contributory life, in

* An Almshouse provided shelter in a community for people who could no longer work to earn enough money to pay rent and they were therefore primarily for the poor. As such, stigma was attached to them.

whatever way we want to define this as individuals, into our 70s and 80s and even 90s before real old age begins to reduce our potential for this.

European populations were surprised by the fundamental changes brought about by the ageing of their populations in the latter part of the 20th century – a combination of demographic resistance to the idea that human longevity could exceed expectations and the decline in mid- and late-life mortality as the prevention and treatment of life style diseases such as cardiovascular diseases improved.

The future will also present surprises and challenges if the evidence is ignored of the significantly increasing number of extremely long-lived individuals in our societies. The 21st century as the century of centenarians will be challenging in both the developed and the emerging economies of the world. Regardless of location, the trend has fundamental consequences for the way in which individuals view and live these extending lives, but also for the way in which societal infrastructures (education, workplace, housing, transport, health and social care) will need to be adapted to the needs of these extreme aged populations.

How could/should people begin to prepare themselves for such long lives? At the individual level the trend presents a challenge to life course planning. Family dynamics will be challenged by the survival of these extremely long-lived generations delaying intergenerational succession and inheritance and depending on smaller families for support in frail and dependent old age. Given increasing life expectancy and longevity, individuals potentially have the opportunity to contribute to their families, communities, and workplaces for much longer.

And let us finally not forget that as more and more of us live or aspire to live in urban communities, it is vital that these communities are managed and developed responsibly. Our urban communities are arguably important drivers of development as significant proportions of any nation's economic activity, government, business and trade, and transportation emanate from these communities. Those living in these communities potentially have access to better education, better health, and social services, and they have better and more opportunities for cultural and political participation. But for all these positive aspects of urbanisation, rapid and unplanned urban growth can be a threat to sustainable development. This happens when the necessary infrastructure is not developed or when the benefits of urban living are not distributed equitably across the tens of millions of citizens in these communities. Urban areas then become more unequal communities with millions of the urban poor living in unacceptable conditions.

Population change will indeed change our world as we move deeper into the 21st century. Much of the narrative around ageing and urbanization is one of success. However, if individuals and societies fail to adapt to the transformations ahead, success may end up turning bitter-sweet.

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Dr. George W. Leeson is Co-Director of the Oxford Institute of Population Ageing, University of Oxford. His Doctoral work was in Demography, firstly at the London School of Hygiene and Tropical Medicine and then at the University of Copenhagen, where he worked as an Associate Professor at the Institute of Statistics, University of Copenhagen. His main research interests are in the socio-demographic aspects of ageing populations, covering both demographic modelling of population development and the analysis of national and international data sets. He directs the Institute's research networks in Latin America (LARNA) and in Central and Eastern Europe (EAST) and also the Centre for Migration and Ageing Populations (MAP Centre). Dr. Leeson has directed the Danish Longitudinal Future Study, which elucidates the attitudes and aspirations of future generations of older people in Denmark. His current research includes the demographic inequalities of global ageing, the changing populations of Europe and Latin America, migration and migrants in Europe, causes and consequences of depopulation in Central and Eastern Europe, and future prospects for longevity.

He is a leading member of The Complex Environmental Population Interactions Project which unites key demographers, economists, anthropologists, philosophers and environmentalists to address the range of complex interactions between environmental and demographic change over the first half of the 21st century.

Annals of Manchester, 2018

The idea of publishing an annual record of events in the Greater Manchester area along the lines of the much-consulted *Annals of Manchester,* compiled by William Edward Armytage Axon, was one of the final projects initiated by Professor Donald Cardwell before his death in 1998. That the publication of such a record will be of interest not only to present readers but future historians and researchers can hardly be questioned. Readers should note that Axon's *Annals,* covering the years to 1885, is now available on the internet. It is also fully searchable, yielding far more references than can be identified using the printed index, which is heavily weighted towards the names of individuals. This will further increase the usefulness of this most valuable local reference work.

As in previous years, corrections and amendments to this year's entries should be sent to Terry Wyke, Manchester Metropolitan University, Department of History, Politics and Philosophy, Geoffrey Manton Building, Rosamond Street West, off Oxford Road, Manchester M15 6LL. Entries for inclusion in the Annals for 2019 should be sent to the same address.

The entries below cover the period from the beginning of January to the end of December 2018

Monday 1 January New Year's Eve celebrations in Albert Square included remembrance of those killed in the Manchester Arena bombing in May 2017.

Thursday 4 January Ben Kelbie, 32, from Chadderton, a prisoner waiting for sentencing was found dead in Strangeways (HMP Manchester).

Monday 8 January Barbara Coombes, 63, of Matlock Road in Reddish, Stockport charged with the murder of Kenneth Coombes in Stockport. She had walked into a police station and claimed she had killed her father and buried him in back garden.

Sunday 14 January Large numbers of people visited Manchester Town Hall open day before its six-year closure.

Tuesday 16 January The collapse of the construction firm Carillion impacted on many large-scale building projects in the city and region, including Airport City, apartment and office developments in the city centre. Select Property Group brought in Sir Robert McAlpine to complete its Affinity apartments scheme on New Bailey Street, Salford.

Wednesday 24 January Mark E Smith, age 60, died. He was lead singer of post-punk band The Fall. Born in Broughton, Salford, in March 1957, Smith moved to Prestwich at a young age and lived there for the rest of his life.

Thursday 25 January Northern Powerhouse minister, Jake Berry, visited Manchester Airport to promote campaign to boost the region's appeal to visitors, especially from China.

Friday 26 January A street in Collyhurst named after the boxing coach, Brian Hughes who was founder of Collyhurst Lads Club. Greater Manchester Mayor Andy Burnham and Lord Mayor Eddy Newman were among those at the event. Hughes received an MBE for his outstanding contribution to British boxing in 2015.

Curators at Manchester Art Gallery removed John William Waterhouse 'Hylas and the Nymphs' (1896) to stimulate public discussion about the presentation of the female body in the gallery. The removal was filmed and will be shown as part of an exhibition by Sonia Boyce in March.

Sunday 28 January Metrolink launched a new easier to read route map, using different colours to distinguish tram lines.

Sunday 4 February John Mahoney, actor, died, aged 77. He was born in June 1940, the family having been evacuated from Manchester. He spent his childhood in Withington and decided to become an actor. He moved to the USA, where he acted on stage and in films, finding fame playing the role of Martin Crane in the popular television comedy series *Frasier*.

Prisons Ombudsman to investigate the sudden death of Nicola Birchall, age 41, a prisoner at HMP Styal.

Friday 9 February Liam Miller, professional footballer, age 36, died. Miller played for Manchester United and also represented the Republic of Ireland.

Wednesday 14 February *Oldham Evening Chronicle*, which ceased publication in August 2017, was re-launched under new ownership (Credible Media) as an online publication.

Thursday 14 February Police seized drugs and firearms in coordinated raids in Crumpsall, Harpurhey and Cheetham Hill, as well as Salford, Rochdale, Dukinfield and Heywood. They arrested 12 males and one woman.

Friday 23 February Opening of 'Annie Swynnerton: Painting Light and Hope' exhibition at Manchester Art Gallery. This is the first major exhibition of the Manchester artist for a century.

Monday 26 February A home-made bomb exploded outside flats in Stonemill Terrace, Penny Lane, Stockport.

Tuesday 27 February Severe winter weather (Anticyclone Hartmut –the 'Beast from the East') disrupted road and rail traffic and caused school closures across the region.

Wednesday 28 February Colin 'Nana' Timmins, the oldest drag queen (Madame Aries) in the Manchester Gay Village, died, age 60. He was a popular figure and his passing was celebrated in the Gay Village.

Parisa Motei-Tehrani, 33, sentenced to 100 hours community work for daubing graffiti on the cenotaph in St Peter's Square in January.

Thursday 1 March Plans put on public display for new 6.5 acre terrace riverside park around the Mayfield depot, opposite Piccadilly station.

Friday 2 March Heavy snow and strong winds caused travel problems. Hundreds of motorists were trapped on Pennine stretch of M62.

Makki Masjid Mosque, Longsight and Khizra Mosque, Cheetham Hill opened their doors to help homeless during the cold weather.

Thursday 8 March Manchester celebrated International Women's Day.

Friday 9 March It was announced that House of Fraser, owners of Kendals department store in Deansgate, had been sold by its Chinese owners to the Chinese tourism group, Wuji Wenhua.

New production of *Frankenstein* by April De Angelis opened at Royal Exchange to mark the 200th anniversary of Mary Shelley's novel.

Saturday 10 March Independent public inquiry called for by SAVE Britain's Heritage, Manchester Civic Society and other heritage organisations into the proposed 40-storey tower block between Deansgate and Albert Square. Manchester City Council had approved the St Michael's scheme, which is led by Gary Neville and Ryan Giggs.

Sunday 11 March St Patrick's Parade through the city centre was one of highlights of the Manchester Irish Festival.

Tuesday 13 March Longford Centre to combat homelessness officially opened in Chorlton.

Wednesday 14 March Jim Bowen, age 80, died. He was host of the popular ITV game show *Bullseye* in the 1980s and 90s.

Thursday 22 March Dame Frances Cairncross to chair official investigation into the sustainability of high quality journalism amidst declining circulation of newspapers and the closing of local and regional titles.

Wednesday 4 April Ray Wilkins, professional footballer, died, aged 61. Wilkins played for a number of leading clubs including Chelsea, Manchester United and AC Milan. He played 160 times for Manchester United, helping to win the FA Cup in 1983. He also earned 83 England caps.

Saturday 7 April Tyrelle Burke, age 20, stabbed and killed at house in Crossacres Road, Wythenshawe. His friend, Denver Walton, 18, was arrested and jailed for the crime.

Northern Vegan Festival at Manchester Central.

Wednesday 11 April Premiere at Dancehouse of *New Dawn Fades*, a play about the lives and times of Joy Division in Manchester.

Friday 13 April A multi-media event featuring music, poetry, spoken word, and digital projection was held in Manchester Cathedral to mark the Battle of Manchester Hill in northern France, March 1918.

Monday 16 April New four-star hotel building approved on corner of Portland Street and Sackville Street. Manchester Council's plans to redevelop this area on the edge of the Gay Village, include demolishing the Chorlton Street bus station.

Sunday 22 April Thousands of people watched the floats and bands in the St George's Parade on its route from Miles Platting to Piccadilly Gardens.

Friday 27 April Midnight walk organised to raise funds for St Ann's Hospice.

Saturday 28 April Anti-abortion protests outside the Marie Stopes centre, Fallowfield.

Thursday 3 May In the local government elections the Labour Party won 94 of the 96 seats in Manchester, the remaining two seats went to the Liberal Democrats, an increase of one for the Liberals. In Trafford the Conservatives lost control of the council.

Saturday 5 May A road in Newton Heath was named George Stringer VC Drive in honour of Stringer (8th (Ardwick) Territorial Battalion of the Manchester Regiment) who was awarded the Victoria Cross for holding off Turkish forces during the Battle of Dujaila in 1916.

John Kinsella, age 55, shot and killed. He was a prominent figure in Manchester underworld and friend of Paul Massey who was shot in 2015.

Monday 14 May Manchester City held open-top bus parade through city centre to celebrate their winning of the Premier League, scoring a record number of points and goals.

Tuesday 15 May Metrolink inspectors to be issued with body cameras to record antisocial behaviour on trams and at stations.

Thursday 17 May *Manchester Evening News* was named Newspaper of the Year, Website of the Year and Social Media Team of the Year at the UK Regional Press Awards.

Friday 18 May Commuters using Northern Rail services were increasingly angry over poor service. The company cancelled almost 1700 trains in Manchester region between February and April.

June Hitchen, Miles Platting and Newton Heath councillor, sworn in as Manchester Lord Mayor.

Sunday 20 May Bronze statue of Joseph Brotherton returned to Peel Park, having been removed in 1954. The ceremony was attended by members of the Brotherton family.

Competitors in Greater Manchester Run observed one minute silence for victims of Manchester Arena bombing before the race.

Monday 21 May Four Kiddi Days private nurseries in Clayton, Longsight, Moss Side and Whalley Range closed without notice to users.

Tuesday 22 May Manchester observed a minute's silence in memory of those who died in Manchester Arena bombing. Prince William, Theresa May and Jeremy Corbyn attended memorial service at Manchester Cathedral. As a mark of respect to those who lost their lives in the bombing, bells were rung from St Ann's Church, St Mary's Catholic Church (the Hidden Gem) and the Town Hall at 10.31pm.

Wednesday 23 May Jacek Serafin, a pianist, was found guilty at Manchester Crown Court of sexually assaulting a woman at the Royal Northern College of Music in 2014. He was sentenced to 14 years in his absence, having fled the country.

Thursday 24 May Zak Bolland, David Worrall and Courtney Brierley found guilty of manslaughter of the Pearson children in December 2017. Bolland was jailed for a minimum of 40 years, Worrall for 37 years and Brierley 21 years.

Thursday 14 June The Institute for Public Policy Research North called for introduction of congestion charge in Greater Manchester to help reduce air pollution and reduce premature deaths.

Saturday 16 June Noel White, 28, was attacked outside Indigo nightclub and later died in Heysham Avenue, Withington. Hedley Plummer was charged and tried with his murder but found not guilty.

Wednesday 20 June Manchester's reputation as a vocal and pioneering voice was the central theme of the celebrations marking Manchester Day.

Saturday 23 June Floral tributes left at the statue of the computer pioneer and mathematician, Alan Turing, in Sackville Gardens to mark his birthday.

Sunday 24 June Serious moorland fires in Saddleworth and Winter Hill burned for days before being brought under control. The fires were believed to have been started deliberately.

Monday 25 June Manchester International Airport celebrated its 80th birthday.

Gates erected on Rochdale Canal towpath in city centre. A petition to erect a barrier was launched following a number of people being drowned.

Wednesday 27 June Jason Byrnes, 26, received a life sentence for murder of Mohammed Aftab in Rochdale in December 2017.

Friday 29 June Dr Robina Shah, the new High Sheriff of Greater Manchester honoured at a special ceremony at Manchester Crown Court.

Sunday 8 July Madonna del Rosario procession celebrating Manchester's Italian community.

Monday 9 July National Crime Agency figures indicate a rise in the number of children being used for sexual exploitation and child labour across Greater Manchester.

Tuesday 10 July Medical research and drug development firm Qiagen is to move its European operation to the Oxford Road corridor to create a genomics campus in partnership with the NHS, Manchester City Council and universities.

Wednesday 11 July England's World Cup semi-final match against Croatia was screened at the Castlefield Bowl. Previous matches in the tournament had not been shown following crowd trouble at previous outdoor screenings in the 2006 World Cup and the 2008 UEFA Cup Final.

Sunday 15 July Cancer Research Run for Life in Heaton Park.

Thursday 19 July Bluedot Science and Music festival at Jodrell Bank opened.

Manchester poet Tony Walsh (Longfella) given honorary degree by University of Salford for his services to poetry.

Monday 23 July Opening of Bee in the City trails featuring 101 sculptures of the city's worker bee.

Wednesday 25 July Braham Murray died, aged 75. Murray was artistic director at the Century Theatre in Manchester in 1965. He joined with Michael Elliot and Casper Wrede to found the 69 Theatre Company, which was the forerunner of the Royal Exchange Theatre. Murray directed a number of much praised productions at the Royal Exchange including the *The Rivals* starring Tom Courtenay and Patricia Routledge. His autobiography, *The Worst It Can Be Is a Disaster* was published in 2007.

Thursday 26 July Manchester recorded a 10.7 per cent rise in visitor numbers in 2017. Office for National Statistics figures show that 348,000 people visited the city for a short-break holiday, while 390,000 were on business. Some 71 per cent of visitors came from Europe, 9 per cent from North America.

Wednesday 1 August Plans announced to build 243 homes on Manchester's historic greyhound racing stadium, Belle Vue. Animal welfare campaigners welcomed news of the closure. The stadium opened in 1926 was the first purpose-built greyhound racing track in country. The stadium also hosts stock car racing.

Tuesday 7 August Fire destroyed two industrial units on Hyde Road in Ardwick.

Wednesday 8 August Strike action on Metrolink was averted when drivers accepted new wage deal.

Sunday 12 August Shooting in Claremont Road, Moss Side wounded ten people, including two teenagers. The 'mass shooting' incident was at a street party held during the annual Caribbean Carnival.

Wednesday 22 August Memorial unveiled at Manchester Airport to the victims of the 1985 disaster. A British Airtours 737 plane caught fire on the runway killing 53 passengers and two crew members.

Monday 27 August Drug scare at Manchester Pride when those attending were warned that a toxic industrial chemical was being sold as Ecstasy. The discovery was made by MANDRAKE (Manchester Drug Analysis & Knowledge Exchange), a partnership of Manchester Metropolitan University and Greater Manchester Police.

Wednesday 29 August Major roadworks began on Regent Road to reduce congestion.

Tuesday 4 September Seven gang members from Longsight and Ardwick received life sentences for the murder of Sait Mboob in August 2017.

Wednesday 5 September Rachael Bland, journalist and BBC regional television presenter, died of cancer, aged 40.

Thursday 6 September Profane graffiti daubed on Manchester Cathedral on the eve of a service paying tribute to members of the emergency services.

Saturday 8 September A Lancaster bomber manufactured by Avro was among the planes on display in Albert Square, part of the RAF's centenary celebrations.

Friday 14 September Funeral service at St Paul's, Walkden for the four children of Pearson family who died in petrol bomb attack on their home in December 2017. Their mother, Michelle Pearson, remains in hospital.

Tuesday 25 September Lancashire Cricket Club relegated to the Second Division of the County Championship.

Benefit football match played at the Pairc Ui Chaoimh in Cork to raise funds for the family of Liam Miller, featured a Manchester United legends team against a Celtic and Ireland team.

Wednesday 26 September Two men found dead in Manchester city centre: Hayden Fitzpatrick had fallen from a top floor window in Britannia Hotel; Tom Noakes was found dead in a room in the same hotel.

Sunday 30 September Geoffrey Hayes died, aged 76. Born in Stockport, he was best known for introducing the children's television show *Rainbow* from 1973 to 1992.

Saturday 6 October Manchester Literature Festival opened. Pat Barker, Kate Atkinson and Kate Mosse were among the featured writers.

Wednesday 10 October *Manchester Evening News* celebrated its 150th anniversary.

Annual State of the City Report estimates the city population at 572,000, and expects it to reach 644,100 by 2025.

Oktoberfest festival opened in Albert Square.

Thursday 11 October Manchester Together archive project (overseen by Manchester Art Gallery, Archives + and University of Manchester) collected over 10,000 items, including letters, drawings and cards left in St Ann's Square as a tribute to those who died at the Manchester Arena.

Friday 12 October Plans published by the architects Simpson Haugh for design of Manchester's medieval quarter around the Cathedral and Chetham's School of Music.

Sunday 14 October Jan Oldenburg, founder of the Manchester music venue, the Night & Day Cafe in Oldham Street, died, aged 71.

Monday 15 October After long delays a £290 million bypass from Hazel Grove to the airport and M56 was opened.

Wednesday 17 October 78 Bees sculptures sold for £1.1 million at auction at National Cycling Centre. The money raised went to the We Love MCR charity.

Thursday 18 October Families of the 22 people killed in the Manchester Arena bombing told by Coroner Sir John Saunders that the inquests will not take place for at least 12 months.

Friday 19 October The Irish rock band U2 played first of two concerts at Manchester Arena as part of their world tour.

Saturday 20 October Dancing and fireworks featured in the Diwali Mela festival held in Albert Square.

Thursday 25 October Manchester Metropolitan University announced plans to replace John Dalton buildings, facing Oxford Road, with a new science and engineering campus.

Monday 29 October Twenty people injured when a double-decker bus collided with a car in Cavendish Street, Ashton town centre.

Wednesday 31 October Topping-out ceremony to mark the extension to Terminal Two at Manchester Airport.

Thursday 1 November Drawings of the proposed Peterloo memorial, designed by Jeremy Deller, on display at Manchester Central Library for three days. The memorial will cost £1 million and is to be located in front of the Manchester Convention Centre.

Monday 5 November Mayor of Greater Manchester, Andy Burnham, opened exhibition 'It Will Never Work' featuring works by the Manchester-based regeneration company Urban Splash at Manchester Metropolitan University's School of Art. Urban Splash was founded in 1993 by Tom Bloxham and Jonathan Falkingham.

Window of Metrolink tram shattered by stones thrown by youths in Wythenshawe.

Friday 9 November Manchester Christmas markets opened.

Sunday 11 November Remembrance Sunday. Ceremonies held across Manchester to mark 100 years since the end of the First World War.

Monday 12 November Sir John Timpson chairing task force investigating problems facing urban retailers. In the first half of 2018, 134 shops opened and 192 closed across the North West, a net loss of 58 stores.

Wednesday 14 November Sir Richard Leese topped out the South Tower, Deansgate Square which at 210 metres became the tallest building in Manchester. It is one of four towers in the complex.

Metrolink announced stricter penalties for nuisance behaviour on trams and at stations beginning in New Year. 520 offences were reported in the year to July 2018.

Thursday 15 November Opening of Manchester Animation Festival at HOME.

Manchester Airport reached record rolling annual total of 28,022,344 passengers.

Monday 19 November L.S. Lowry painting, 'A Northern Race Meeting' (1956) sold for £4.5 million at auction at Christie's in London.

Saturday 24 November The PwC choir were winners of the Hallé Corporate Choir competition.

Monday 26 November Johnny Hart, professional footballer, died, aged 90. Hart played for Manchester City between 1947 and 1961, and was manager of the club in 1973.

Wednesday 28 November Kendal's department store which employs over 550 people was saved from closure when new terms agreed between Mike Ashley, owner of the House of Fraser, and the landlord.

Friday 30 November Peter Armitage, television actor, died, aged 78. He was best known for playing Bill Webster in *Coronation Street*.

Thursday 6 December Pete Shelley, musician, died, aged 63. Born in Leigh, he was best known as the frontman of the punk band, Buzzcocks, 1975-81.

ICON Industrial announced plans for new £100 million industrial and office buildings at Airport City, Manchester International Airport.

Friday 7 December Manchester Airports Group announced profits of £164.9 million for April-September 2018. Manchester City Council will receive £22.7 million.

Monday 10 December Duke of York opened Graphene Engineering Innovation Centre at University of Manchester.

Wednesday 12 December Manchester City Council to install additional bollards and concrete barriers in areas of the city centre with high footfall to stop vehicles injuring pedestrians in terrorist attacks.

Tuesday 18 December José Mourinho was sacked as Manchester United manager. Ole Gunnar Solskjaer appointed caretaker manager for the remainder of 2018-19 season.

Friday 14 December Bronze statues of suffragettes unveiled one hundred years to the day when women first voted in parliamentary elections. Emmeline Pankhurst statue (artist, Hazel Reeves) is located in St Peter's Square, Manchester, and Annie Kenney statue (artist, Denise Dutton) in Parliament Square, Oldham.

Thursday 20 December Andre Rieu, "The King of Waltz", played sell-out concert at Manchester Arena.

Friday 21 December Christian Francois Agbo sentenced to 10 years 4 months imprisonment for smuggling drugs. He was detained at Manchester Airport in September having travelled from Benin.

Saturday 29 December Northern Rail warned passengers that a number of services would be cancelled due to industrial action taken by members of the Rail, Maritime and Transport Union.

To a better world?

Ice caps are melting whilst glaciers shrink
Sea levels are rising. Should this make us think?
The tundra is softening, vast forests burn
The corals are bleaching. A lesson to learn?
Each decade is hotter with storms getting stronger
Can anyone anywhere doubt any longer?
Insects migrate, soon followed by us
Diseases develop. Perhaps time to fuss?
Greenhouse gases keep growing, the Keeling curve[1] climbs
But nothing much alters so is there still time?

The science gets clearer as each year goes by
We know how much more we can pump to the sky
With the hope that we only add one more degree
Though that chance is actually two out of three
Or a one in three chance of an even worse state
Barely one decade left without changing the rate

Even that is uncertain - the climate might tip
To a 6 degree rise, an unstoppable ship
Due to methane or ice loss, an ocean upset
Or fossil fuels used without thought or regret
With business as usual and each out for self
Not changing and sharing the world's common wealth.

So where do we start and what will we eat?
Feed people not livestock, more plants and less meat
More veggies, less waste, more sharing, less greed
Then all in the world will be able to feed[2]

We still need to travel so what's the solution?
Make all cars electric and get less pollution
Free buses, cheap trains, on foot or by bike
Share cars or like Cuba we start to hitchhike

Where will the e come from? I hear you all say
From wind, wave and tide, any sun powered way.
Make more than we need[3] and store all the spare
As H_2, in batteries or make liquid air.[4]
With smart meters, smart grids it will never run out
Using local control to share it about

If you want a tough question ask Can we still fly?
Though really the question should always be Why?
I guess we'll keep flying, its not all for fun
And seeing the sights or seeking the sun.
Planes can't go electric except a short way
When trains would be better with little delay

Flying London-New York will add tonnes in a day
Should you have to pay Climeworks[5] to put that away?
Or can some young chemist take carbon from air
To make fuel for your flying, put the cost on the fare.
Whatever the solution we finally use
It must be net-zero – it's not hard to choose

Will homes still be warm? We can make it so
Build to Passivhaus standards[6] with heating costs low
Retrofitting old houses helps green business grow
Using heat pumps and solar, community schemes
Low carbon, low cost being principal themes.

What else must be done? Well don't forget these
There is steel and cement and clothes just for fashion
New methods could change this if followed with passion
Tax polluters per tonne so that they have to pay
For the damage they cause and to fund the new way

Can we do any more? We need land use reform
Plant trees, stop clearance, best practice the norm
Less chemical use, biochar can transform
And whatever we do must be measured and fair
Giving justice, equality, all get a share

Could NETs be the saviour? Should we try SRM[8]?
Put iron in the oceans, pray DAC's[9] not a tease
SO_2 in our skies, more clouds over seas
Whilst everywhere else we just do as we please
With relentless emission of more GHGs.[10]

But remember those methods have many an if
Should we start and then stop we just fall off a cliff.
So can it be sorted? Well don't hold your breath
The near future decides if it's life or it's death

We need leaders of vision acknowledging facts
Putting climate change central to all of their acts

We need a strong message the whole world can see
That this is our home, there's no planet-B
We need everyone everywhere taking the view
That we are all equals, no "me but not you"
We need to think global in decades not years
And let youngsters decide how to vanquish our fears

So tax us, ignore us, don't do what we did
Make a world fit for humans and wildlife to live

Brian Tyler
May 2020

References

1. The Keeling curve - the long term measurement of atmospheric CO_2 based at the Mauna Loa observatory in Hawaii and giving a continuous record for the past 60 years.
2. See for example *Climate-Smart Food* by Dave Reay. Available in print and as a free ebook.
3. See *What We Need to Do Now* by Chris Goodall. Available in print and as ebook.
4. Cryogenic energy storage by liquefying air. A method being developed in the UK by Highview Power.
5. Climeworks - a company with a patented method for capturing CO_2 from the atmosphere.
6. The Passivhaus standard and methodology is the leading international low-energy, design standard.
7. NETs— negative emission technologies. Ways of removing CO_2 from the atmosphere to reduce its level.
8. SRM - solar radiation management. Ways of reducing the net radiation input from the sun. For example, mimic high level aerosols from volcanoes or increase cloud cover over the southern oceans.
9. DAC - direct air capture removes CO_2 from the atmosphere. It is either sequestered underground or used to make fuel. It is a NET.
10. GHGs – greenhouse gases, especially CO_2, methane, nitrous oxide, chlorofluorocarbons (CFCs).

After completing his first degree and postgraduate work at Cambridge, Dr Tyler moved to Manchester in 1963 as a lecturer in the Chemistry Department at UMIST. His early work on gas phase reactions had applications to the chemistry of Los Angeles smog whilst later work concerned acid rain. This grounded his continuing interest in atmospheric chemistry and its effects. Over the past 40 years he has been active in developing the safety technique, Hazard and Operability (HAZOP) Study, both through training and leading studies in the chemical, pharmaceutical and petrochemical industries. Several lectures arranged by the Science and Technology Section of the Lit&Phil during his recent term as section secretary have influenced the writing of this verse. He sees the climate crisis as the greatest problem humanity faces, a concern heightened by the recent birth of his first great-grandchild.

BOOK REVIEW

Alan Turing's Manchester

by Jonathan Swinton

Few people in Britain had heard of Alan Turing before the publication of Andrew Hodges' astonishing and sympathetic biography *Alan Turing: The Enigma* in 1983. Thanks to his researches, which reached a wider audience through Hugh Whitemore's play *Breaking the Code* (1986) and films such as *The Imitation Game* (2014), Turing is now far more widely known. Indeed, in 2021 he is to be pictured on the £50 banknote. Today, it would be a brave historian of science who would try to dislodge 'the father of modern computing' from his place in the pantheon of the great mathematicians.

Much of the public focus on Turing has been on the Bletchley Park years, where one can now visit the restored codebreakers' huts. Less consideration has been given to the six years he spent in Manchester, and it is these that are the focus of Jonathan Swinton's book. At the time of his arrival in 1948, Manchester was already at the frontier of research in engineering computers, Tom Kilburn and Freddie Williams running the first program on the Small Scale Experimental Machine (aka the 'Baby') in June 1948. Having already provided the design for a stored-programme computer (Automatic Computing Engine), Turing was well aware of the significance of this research. Swinton provides an account of Turing's links with the ongoing work of Kilburn and Williams that would lead to the Ferranti Mark 1. Turing's work on the exciting area of artificial intelligence continued and it was at Manchester that he established what was to become known as the 'Turing Test'. This was a revolution in the making. Turing's prophetic assertion that 'This is only a foretaste of what is to come, and only the shadow of what is to be' should be stamped on every smartphone in the world.

Biographical sketches are provided of Turing's university colleagues and others who came within his orbit. These included Michael Polanyi, Dorothy Emmet and the surgeon Geoffrey Jefferson. Some of the key figures had been convinced to come to the university by the dynamic Patrick Blackett, professor of physics. This was the case with the mathematician Max Newman, who in turn persuaded Turing to come north. Phyllis Nicolson, Cicely Popplewell and Audrey Bates are also included in these sketches, Swinton making the important point that these pioneering years of computing were not entirely dominated by men.

Whatever the lure of personal career opportunities, the city itself disappointed many of those who had left either Oxbridge or London. For Max Newman's wife, Lyn, who can be credited with broadening Turing's fiction reading, Manchester was a cultural backwater, a place without either decent libraries or bookshops. However, in the absence of an authoritative history of

post-war Manchester, many aspects of the city's broader history, let alone its intellectual culture, can only be lightly sketched. The city was, as Lit and Phil members will not need reminding, patching itself up in these years: repairing its cathedral and cotton exchange, and, most revealingly of all for those interested in its cultural atmospherics, building a new modernist Free Trade Hall for its illustrious orchestra. More might be said about the largely Manchester-centred 51 Society which established a weekly radio programme exploring issues of the day, broadcast on the Home Service (North). Its standing was evident in its ability to attract eminent guest speakers (Beveridge, Bronowski, Morrison, Tyrone Guthrie, Violet Bonham Carter et al) to introduce a subject which was then discussed by members of the society. University members included Polanyi, Blackett and Stopford, as well as other prominent city figures such as Eric James and Shena Simon. In a footnote, Swinton pours cold water on the suggestion that Turing may have been a guest speaker on the subject of intelligent machines in one of the early programmes, he having already contributed a radio talk on the Third Programme.

Swinton also covers Turing's sexuality which was to result in prosecution following his self-identification to the police in Wilmslow, at the very time when there was increasing public sensitivity over homosexuality and the threat it posed to public morality. Unfortunately, there is no closely researched history of Queer Manchester in these years, but Swinton does provide some revealing evidence on the city's gay culture, including its geography, more particularly of the cinemas, cafes, pubs, and public conveniences along and around Oxford Street. Less is said about how Manchester was responding to the debate over the apparent increase in homosexuality and the pressure to punish homosexuals in order to protect young people. The issue of official attitudes towards offences committed by consenting adults in private homes was, of course, one of the threads in the knot of the decision to prosecute Turing in 1952.

A selection of images complement the narrative, some more relevant than others. These include photographs of the university staff common rooms and publicity shots of Turing and the Ferranti Mark 1 but it was Turing taking part in an unidentified athletics race that caught this reviewer's eye, a reminder that he sometimes chose to run from the suburbs to his office at the university. Other images – photographs of the city being brought to a standstill by smog, Oxford Road at night, and London Road Station – might also have been included. Maps also feature in the illustrations but readers would have benefited from a detailed map of Oxford Road and Oxford Street, a part of the city that Turing came to know well.

Swinton's book is not the definitive account of Turing's Manchester years but it does succeed in making them less of an enigma. One puts this book down with a feeling of sadness given the tragedy of Turing's early death – he was only 41 – and that Manchester has still not fully publicly recognised his extraordinary achievements. Glyn Hughes's statue of Turing in Sackville Gardens was privately funded, whereas the public tributes have been limited to plaques on buildings and the naming of a road after him. This is memorialisation

on the cheap. Manchester having rightly spent £1 million on a monument to recognise the Peterloo Massacre, might give consideration to commissioning a proper memorial to the 'father of modern computing', perhaps a statue to be placed next to those of Dalton and Joule as part of the ongoing restoration of the town hall. A crowdfunding platform, limited to individual donations of no more than one of the forthcoming 'Turings', is the obvious way forward.

Terry Wyke

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£15 plus p&p at www.manturing.net
£24.99 in bookshops.

Telling the Time in Industrial Manchester and Salford

TERRY WYKE

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Members of the 'Lit and Phil' will know of the links between its most celebrated member and the Portico Library, in particular that John Dalton's membership of the library was provided on the not too onerous condition of him looking after the clock[1]. Those who have spent time in the library will have admired John Thwaites's clock, perhaps even pausing to wonder why such an impressive timepiece was not on the outside of the building. Historians have argued convincingly that such mechanical clocks were part of a long revolution in time consciousness, machines which enabled society to measure time ever more precisely and which preceded and underpinned that 'wave of inventions' that have come to represent the industrial revolution[2]. But, if in the early nineteenth century one was not a member of that select group of gentlemen who belonged to the Portico Library and thus unable to consult what was one of the largest clocks in the town, how did one determine what the time was? In a society where the God-given rhythms of the day were being replaced by man-made ones, where punctuality was becoming one of the primary social virtues, how did one ensure that one arrived on time for work, for a church service, for the first race at Kersal Moor or even for a public meeting on St Peter's Field? In short, in what was already one of the most advanced centres of the new industrial world and in an age when portable timepieces were among the luxuries that even better-off consumers aspired to own, what clocks were available to Manchester people and how did one know that they were accurate?

In pre-industrial Manchester it was the church, more particularly the church bells that marked time. The clock in the Collegiate Church was the most important one for most inhabitants because it was their only clock. The earliest record of a clock in the church dates from around the mid to late fifteenth century but it may not have been until the seventeenth century that a clock with a dial and hands was fixed in the tower. Before and long after a clock was installed, the importance of the church bells in announcing time should be recognised, though their changing contribution to the aural landscape over the centuries requires further investigation[3]. In 1665 the Churchwardens' accounts record two payments totalling £30 towards a clock and chimes, and in subsequent years there is a running list of monies paid for the upkeep and repair of the clock, including in 1700 when John Low was paid £24 'In exchange for a new Clocke for the old one By agreement'[4]. It is reasonable to assume that as domestic clocks were not common that it was Low's clock that the local petty tradesman Edmund Harrold measured time by when he recorded specific

hours of the day in his diary[5]. Little is known of the early clockmakers at the Collegiate Church until around 1763 when Henry Hindley, the York-based maker of clocks and machine tools, was paid for what was described as 'a curious and elegant clock' that 'gives great satisfaction to the whole parish'[6].

Figure 1: All Saints Church, Oxford Road, demolished 1949

By the early nineteenth century clocks began to be installed in some of the town's Georgian churches, including St Ann's and St John's, neither of which had clocks when originally built. Whitehurst and Son of Derby, for example, manufactured the clock installed in 1832 in St Philip's, Salford. Calls continued to be made for clocks to be placed in other city-centre churches such as St Peter's, requests that reflected in part the needs of an expanding business community. A closer examination of vestry and churchwardens' accounts will identify the monies spent on installing, maintaining and improving individual clocks, including the date when the dials were illuminated, the gas for which was supplied by the local gas company either free or at a reduced price. Of these new public clocks, one of the most significant examples was in the fast growing township of Chorlton on Medlock. All Saints church had no clock when it was consecrated in 1820 but in 1826 the Chorlton Row commissioners brushed aside arguments that they were not legally allowed to spend ratepayers' money for such a purpose and went ahead and installed one, making use of the bell already in the tower[7]. Church clocks were now being identified as public responsibilities, to be added to a lengthening list of services being taken on by police and improvement commissioners which in turn were to be passed on to the municipal corporations following the reform of local government in the 1830s. Thus it is not surprising to find that listed among the responsibilities of

the new Manchester Corporation was the maintenance, repair and illumination of 'all or any of the public clocks in the borough' and the powers to purchase and erect new ones 'in such convenient public places as to the council may appear expedient'[8]. This may have seemed a small matter in the wider concerns of the 1844 Police Regulation Act, but it was important for the smoother operation of a city of business, a place where, in the telling words of one letter writer in the local press, 'time is so peculiarly the estate of the people'[9]. By the 1830s it was evident that the provision of accurate time in the community was slipping out of the hands of the church and becoming a municipal responsibility.

Part of the public demand for more clocks can be traced back to Manchester's burgeoning cotton industry. Clocks became a small but crucial part in the furious debate that developed around reducing the number of hours worked in the new cotton mills. A clause in the landmark 1844 Factory Act required working hours to be regulated according to a public clock, focusing attention on the question of which or whose clock was to be used to determine when work and meal breaks started and finished. Such public clocks, like weighing machines, had to be identified and regulated. Clocks, of course, could be manipulated by employers, and they were if one accepts the evidence presented by working men such as James Leach in his *Stubborn Facts from the Factories by a Manchester Operative* (1844). Time-cribbing in cotton mills was to take many forms and factory inspectors were still bringing prosecutions against employers in the Edwardian years[10].

Ensuring that public clocks kept accurate time became an even more pressing matter with the coming of the railways. Solar time had not caused problems for intercity stagecoaches but it was increasingly confusing and potentially disastrous for the railways and, as is well known, it was the requirements of the railways that led to the introduction of British standard time. It was in December 1847 that the main railway companies adopted Greenwich Mean Time, a change that was dependent on the recent invention of the electric telegraph which allowed a signal to be transmitted from Greenwich at a specific time each day. The creation of a single time zone for the country was to be one of the railway's most significant impacts on Victorian society. Manchester's business community needed no convincing of the advantages of synchronised time in an economy where people and goods were moving at ever faster speeds, and the loss of 8 minutes 56 seconds (for convenience it was generally adjusted to 10 minutes) passed without even a wisp of the protests that occurred in some towns. Indeed, local businessmen such as the printer George Bradshaw, whose railway timetables were specifying 'London Time' as early as 1839, must have considered the change overdue.

Both Manchester and Salford had recognised the importance of maintaining and regulating public clocks long before 1847. In Salford Francis Abbott, author of *A Treatise on the Management of Public Clocks, particularly church clocks* (1835) was appointed in 1834 to look after the clocks in Trinity and St Philip's, whilst in Manchester these duties were to taken on by Peter Clare. Quaker Clare did not have Abbott's colourful life – that is to say he was never transported to

Tasmania – but he was a recognisable figure in the town, known for his expertise in horology and his friendship with Dalton[11]. How assiduously he attended to ensuring the accuracy of the public clocks is difficult to assess, though if one regards Canon Richardson as a reliable witness then he did not carry out his duties to everyone's satisfaction. The slow running of the all-important Collegiate Church clock featured in Richardson's popular tale *The Old Church Clock* (1843), in which he paused the narrative to explain to his readers that 'For friend Peter Clare is sometimes more attentive to the accuracy of his own external appearance, than to the correctness of those measures of time which her majesty's subjects have committed to his regulation'[12]. This was not the first time that Clare had been criticised by members of the Collegiate Church, some having taken issue with what they considered his excessive charges for rebuilding their clock in the 1820s.

Manchester's concern that Greenwich Time should displace local time was evident by the Corporation providing £100 to purchase a clock to serve as the city's governing timepiece. Peter Clare built the regulator clock and he took on the duty of operating it, receiving an annual salary of £16. One might easily dismiss the work of the clock committee as a quiet backwater of an ever-busy local state but it is evident that Manchester Corporation took its responsibility of setting the correct time seriously. Clare's successor, Rev Henry Halford Jones, was appointed to the post of 'Astronomer to the Corporation' on an annual salary of £40, Edinburgh being the only other town to establish a similar post. Money was also provided to purchase scientific instruments, but the municipal astronomer's chief purpose was to ensure that the regulator clock and the other public clocks were working correctly. Hunter's successor was Joseph Baxendell, yet another member of the 'Lit and Phil', an active scientist who is remembered for his researches into meteorology and astronomy[13].

The regulator clock was located in the vestibule of the King Street town hall 'for the purpose of informing the public at all times what is Greenwich time'. Although railway time was determined by the sending of a time signal by means of the electric telegraph, it appears that for a number of years the Manchester regulator was also checked by astronomical observation, even though the Corporation had access to the electric signal. The regulator remained in the King Street building after the opening of the new town hall, where, presumably, among those consulting it would have been members of the 'Lit and Phil' who did not own their own regulator, not least those whose interests included observing meteors and eclipses[14].

Ownership of domestic clocks and pocket watches was increasing throughout the nineteenth century, and as was the case with most consumer goods they were enjoyed by servant-keeping families long before others in the population. Carriage, mantel and wall clocks became familiar objects in the various rooms of bourgeois homes, though even approximate numbers are lacking. Some rooms were more private than others and we have to turn to literature to hear the loud ticking of the 'deadly statistical clock' in that windowless observatory somewhere in Textile Lancashire where Mr Gradgrind

was to be found carrying out his financial and moral calculations, a timepiece 'which measured every second with a beat like a rap upon a coffin-lid'[15]. Even when writing against the clock, Dickens always found time to re-stitch and re-frame a cliché. Discussing, let alone measuring the spread of clock ownership among the working classes poses far greater challenges, but if we accept Angus Bethune Reach's observations of workers' homes in Manchester, then by the late 1840s clocks were already to be found in the households of skilled workers. 'No Manchester operative will be without one a moment longer than he can help' writes Reach when visiting Ancoats, 'You see here and there, in the better class of houses, one of the old-fashioned metallic-faced eight-day clocks; but by far the most common article is the little Dutch machine, with its busy pendulum swinging openly and candidly before the world'[16].

Victorian Manchester and Salford saw a sharp increase in the number of public clocks. Retailers became more aware of the advertising value of clocks. A novel initiative came from the well-known firm of clockmakers, Arnold and Lewis, who installed a time ball in their shop in St Ann's Square, which was connected to Greenwich and which fell daily at precisely 1.00 pm.

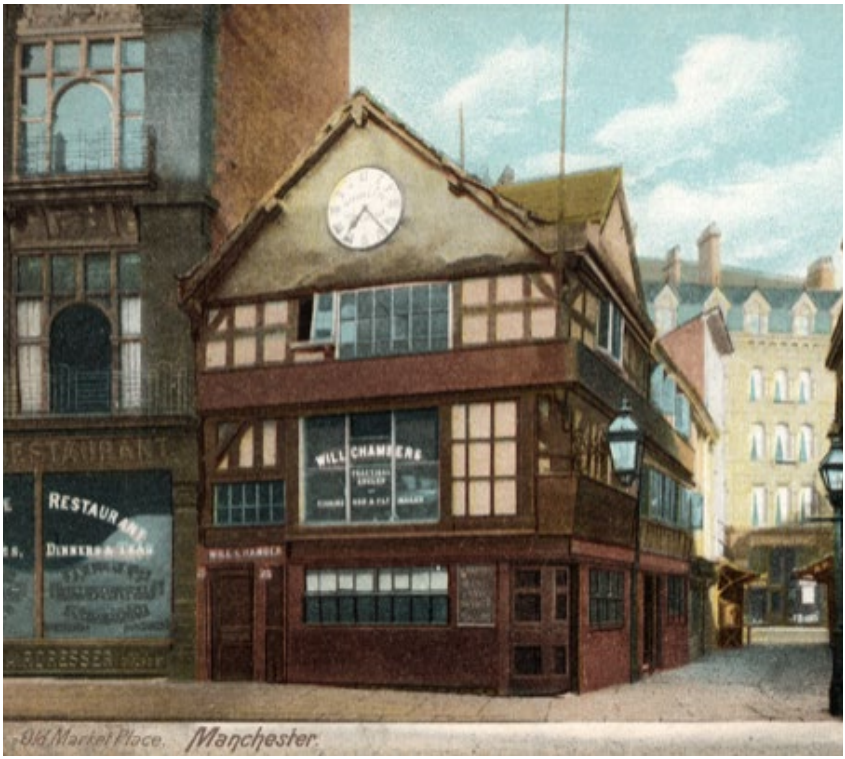

Figure 2. W. & M. Dodge clock on the Wellington Inn, Market Place

Sometime after 1870, William and Morton Dodge, clockmakers and jewellers in the Market Place, fixed a large clock displaying their name in the gable end of one of Manchester's historic sixteenth-century buildings, namely the Wellington Inn on the corner of Market Place and Old Shambles.

Photographic evidence indicates that shops in Market Street in particular displayed various external clocks, two of which are particularly noteworthy. The first was in the form of a large pocket watch on the premises established by Harriet Samuel, her jewellery and watch selling business becoming one the leading and longest surviving multiples in the country. Almost opposite Samuel's shop and workshops was the Manchester branch of David Lewis. This behemoth of Manchester department stores displayed a number of outdoor clocks over the years, none more eye-catching than the one above the tower entrance facing towards Piccadilly. This Edwardian clock had neither dial nor hands, taking the then novel step of using a digital-type display. Rival stores competed and it is no surprise to find that Pauldens installed an impressive clock on the corner of its new store in Cavendish Street. Other companies also added to the number of public clocks, regarding them as a forceful symbol of their trustworthiness. Such clocks varied in size and design but all were to be eclipsed by the four-dial clock tower on the Refuge Assurance Company building on Oxford Street. This was completed in 1911, a structure which provided Paul Waterhouse with the opportunity to emulate his father and leave his own mark on the city skyline.

But we should recognise that our knowledge of these public clocks is patchy. Surprisingly, given the importance of railways in determining time in the nineteenth century, there has been no detailed study of clocks in Manchester's many railway stations. This is all the more unexpected when one recalls that the first known public timepiece appears to have been not a clock but a sundial, placed above the first-class entrance to the now world-famous Liverpool Road station in 1833. Clocks were prominent features on later stations, including London Road station (Piccadilly) and the eye-catching pair of ornately framed clocks on the Hunts Bank facade and Todd Street corner of Victoria station. Other highly visible railway clocks were fixed on the exterior and interior of Exchange station. These clocks, along with the portable clocks distributed to railway staff, were essential for the day-to-day running of the railways. Equally surprising is the absence of research into workplace clocks, not least those which were erected outside factories. This is even the case with the remarkable clock which was made for the third Duke of Bridgewater by Samuel Collier of Eccles in about 1788. It struck thirteen times at one o'clock because of the Duke's concern that his workers at Worsley might have missed a single bell calling them to return to work. One of the forgotten survivals from the industrial revolution, this much repaired clock is now in St Mark's, Worsley where it can be heard striking thirteen o'clock, an early if unusual example of the many thousands of now lost clocks which established the workplace rituals of 'clocking in' and 'clocking out'[17].

Figure 3: Manchester Town Hall, clock and bells inaugurated January 1879

Manchester Corporation was also to make a significant contribution to this wave of new clocks. Municipal clocks were installed on buildings ranging from market halls (Smithfield Market) to park lodges (Phillips Park, Alexandra Park) to public baths and washhouses (Cheetham Hill Baths, Victoria Baths, Hathersage Road) to cemetery offices (Southern Cemetery). Public clocks also became a feature of the transport depots located in the inner suburbs. These included an unusual five-sided clock in the tower of the tram depot on the corner of Devonshire Street and Hyde Road, Ardwick, and the more prosaic clock tower on the Princess Road depot, Moss Side. The four-dial clock fixed in the Elizabethan style tower of the offices of Bradford Road gasworks must have surprised those who had reason to visit this smoke-choked district of late Victorian Manchester. But, in this long list of municipal clocks, it was the one made by Gillett and Bland for the new town hall that established itself as the city's timepiece. It claimed to be the most technologically advanced clock in country when it began operating on New Year's Day, 1879, although, initially it did not receive an electric signal from Greenwich. Visually and acoustically prominent – the diameter of the dials was 15 feet 9inches, each minute separated by a gap of 9.5 inches – it became the most consulted clock in the city. Its Westminster chimes were soon a distinctive part of the city soundscape and it was said that the eight-ton clock bell could be heard as far away as Oldham and Wilmslow! Mancunian pride overflowed and within a short time the custom of gathering in Albert Square to see and hear their magnificent clock and its carillon welcome in the New Year was established.

Figure 4: Manchester Town Hall at night, illuminated clock dial

Of other Victorian public clocks the illuminated four-dial clock installed in the rebuilt Royal Infirmary in 1854 was noteworthy in that the cost was met by the Corporation, the Improvement Committee deciding that spending £1000 was justified as the old clock was regarded as one of the most consulted in the city-centre. Edmund Beckett Denison (later Lord Grimthorpe), now remembered as the pugnacious and argumentative designer of 'Big Ben' and the inventor of the gravity escapement, designed the clock[18]. The new clock further strengthened Piccadilly's importance in the mental maps of workers and visitors to the city. In this rapid review of new city clocks one should also note the clock in the tower of Thomas Worthington's City Courts in Minshull Street, completed in 1871. It became another landmark clock. From 1873 academics at Owens College on their way to give lectures were able to measure their stride by looking up at the clock which had been installed in what was to be the university's quadrangle. This is not to suggest that all major buildings in Manchester displayed clocks. In some projects they were not part of the design whilst in others they were planned but never installed.

Figure 5: Manchester Cathedral

In addition to new clocks these years also saw the necessary upgrading and replacement of existing ones, including many church clocks. These included the Cathedral where a new clock and bells were installed following the completion of the rebuilding of the tower in 1868. Once again the Corporation was involved, agreeing to meet the costs of the transparent dials and gas. Among the new church clocks was the one installed in St Paul's, New Cross in 1879, the work of the Manchester firm of Arnold and Lewis. A new four-dial clock was installed at Trinity church, Salford in 1858 by the most widely known firm of local clockmakers, John Bailey of the Albion Works, Salford. The family business was to be continued as part of the much larger engineering enterprise operated by his son, William Henry Bailey. As well as supplying clocks locally, Bailey's also competed with firms such as Potts of Leeds, Joyce of Whitchurch and Smith of Derby for more prestigious turret clock contracts in private and public buildings across the country and abroad. They had some success in foreign markets: John Bailey claimed the patronage of the Peruvian government because he had provided the clock for the Custom House in Paita, Peru, whilst his son was able to publish the extraordinary advertisement that a Bailey turret clock looked 'over the tomb of the prophet at Mecca'[19]. William Henry Bailey also found time to be active in the political and cultural life of both Salford and Manchester, his many public offices included serving as president of the 'Lit and Phil' from 1905-7[20].

The First World War was to bring important changes to public timekeeping, notably the passing of the Daylight Savings Act in 1916. Manchester Corporation and the Chamber of Commerce had recognised the benefits of William Willert's campaign to introduce daylight savings before the war and the city embraced the new system as readily as it had done railway time in 1847. The sheer number of public clocks that had to be altered in May 1916 meant that the City Architects department, which was now responsible for maintaining them, was unable to change all of them on a single day. Another major change that can be traced back to the war was the popularisation of the wrist-watch. They were not issued to all ranks but their purchase was encouraged by commercial companies extolling the benefits of such watches to men in the trenches, so that by 1918 Samuel's was selling a basic active service wristlet watch for 12s 6d, and a luminous model for 17s 6d. Hirst Brothers of Oldham invented a shrapnel guard for wrist-watches. Importantly, the wrist-watch's appeal continued after the war and, no doubt, impacted on the sales of what became regarded as the less fashionable pocket watch.

The inter-war war years witnessed a slowing down in the commissioning and installation of public clocks. Businesses and the general population still continued to consult such clocks to check the time and their usefulness was still evident as in 1935 when repairs caused the town hall clock to be stopped for a month. But the reliance on public clocks was being challenged by new technologies, most obviously in 1924 when BBC radio stations, including Manchester's 2ZY, began broadcasting the Greenwich Time signal. Wireless ownership increased rapidly in the following years and by the mid-1930s waiting for the last of the 'the six pips' before the national evening news bulletin was already the subject of seaside humour. Then in 1938 came another important change, when Manchester homes and businesses with a telephone were able to obtain the accurate time at any hour by ringing the speaking clock. Armistice Day was one of the busiest for TIM. With hindsight, however, it was the 1920s rather than the 1930s that can be identified as the pivotal decade in the history of timekeeping: the invention of the quartz clock in 1927 triggering a horological revolution that was to bring to an end the centuries old dominance of the pendulum clock, to be followed by the demise of the mechanical watch.

Because clocks rank high in the hierarchy of machines that shaped the modern world, it is surprising that they have not attracted more attention in histories of the world's first industrial city. Edmund Davies' pioneer study, *Greater Manchester Clocks & Clockmakers* (2007), is the welcome exception. Moving from the medieval past when a church bell subdivided the day by the sounding of the canonical hours to the present day when clocks are accurate to a tiny fraction of second, it is clear that it was the coming of industrial society that marked the beginning of profound changes in both the perception of time and the relentless subdivision of clock time. The commissioning, manufacturing and erection of public clocks became an important part of this transformation, contributing distinctive shapes and sounds to the industrial world. Clocks increased in number, provided first by the church and then by

the local state, which also took responsibility for ensuring their accuracy. In the twentieth century improvements in personal timepieces reduced the reliance on public clocks, leaving many to become neglected, ignored and then discarded. Throughout these changes the Portico clock remained a private not a public clock and now can claim to be one of the city's oldest. John Dalton's funeral cortege did not pass Thomas Harrison's Portico Library but it was a reflection of the changing attitudes towards time and the ability to measure it with greater accuracy that the leading Manchester newspapers recorded that the procession took 36 minutes to pass a single point on the route from the town hall to Ardwick Cemetery. One can imagine that when Peter Clare and other members of the 'Lit and Phil' read the reports of the funeral in the library's newsroom that they would have taken a particular interest in this detail, knowing that such a specific measurement would not have been recorded, let alone reported, even fifty years before.

Acknowledgements

My thanks to Alan Kidd for commenting on an earlier draft of this essay.

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Terry Wyke is honorary research fellow at Manchester Metropolitan University. He has written on different aspects of the history of the Manchester region including the book trade, cholera, cotton industry, Peterloo, public sculpture and transport. His most recent publications include Manchester. Mapping the City *(Birlinn, 2018) with Brian Robson and Martin Dodge;* Spindleopolis in War and Peace (Gallery Oldham, 2018) *with Alan Fowler*

PROFESSOR IAN MUNRO
Honorary Fellowship of the Institute of Physics

In August 2019, Professor Ian Munro, a member of the Manchester Lit & Phil since 1974, was accorded Honorary Fellowship of the Institute of Physics for his world-recognised leadership in Synchrotron Radiation Source research and development. This is the highest accolade awarded by the Institute.

Speaking of his pride at receiving the award, Professor Munro, former Director of Synchrotron Research and Head of Daresbury Laboratory, mentioned his great satisfaction that the very considerable contribution made by the UK synchrotron research community based at Daresbury had now been recognised. The Daresbury Nuclear Physics Laboratory has played a major role in the multi-national research programme into particle physics. The research carried out at Daresbury centred on a major accelerator (for electrons), NINA (Northern Institutes Nuclear Accelerator), created in 1966, which saw the start of very wide-ranging research into particle physics.

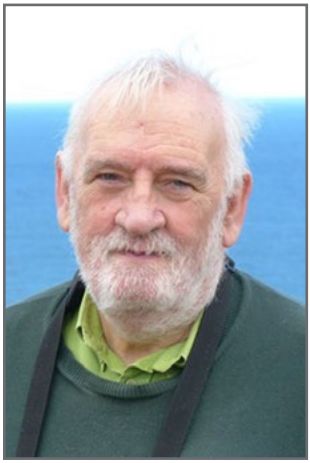
It was in the spring of 1967 that the then Dr Munro, a lecturer in the Manchester University's physics department, wrote a letter to the Director of Daresbury expressing the wide possibilities which NINA presented. Shortly afterwards he was invited to join the research team at Daresbury and there he became the first to realise the possibility of synchrotron radiation being the means of uniquely tunable and intense resources and where he constructed the first x-ray beam, the NINA SRF. As a result of his pioneering work and the extensive research at Daresbury which followed, a second-generation NINA synchrotron was constructed and, since 2009, a third-generation Diamond Light Source, now in operation at the UK's national synchrotron science facility at Harwell, functions with the assistance of Technical and Education staff who previously worked on its development at Daresbury.

As a result of his lengthy research career, which has led to the publication of some 200 articles and a book on synchrotron radiation and related subjects, Professor Munro has initiated a wholly new programme of multi-disciplinary science, attracting colleagues from the UK as well as overseas universities and research centres.

Ian Munro was educated at William Hulme's Grammar School, Manchester and Manchester University where he is Emeritus Professor of Physics. In the Joule Lecture, delivered to the Lit & Phil in February 2010 (see Volume 148 of Manchester Memoirs*) he described x-ray and synchrotron radiation research and recollections of his Daresbury work using them.*

Obituary

DR ANGUS MCDOUGALL
October 1934 - March 2020



It is with great sadness that we present this appreciation of the life of Angus McDougall who died in the MRI on Saturday 14 March 2020 aged 85. Angus joined the Lit&Phil in 2010, became a member of Council in 2014 and was currently chair of the Young People's Section Committee. Diagnosed with painful, incurable but treatable cancer in early 2017, superb treatment from the NHS through the Christie Hospital and his GP allowed him three more years of active life. He used this time with vigour and enjoyment until his final weeks in the MRI.

He was born in West Bridgford in October 1934, just south of Nottingham, within sound if not sight of the Midland Railway line to Melton Mowbray; was a Sir Thomas White entrance scholar at Nottingham High School and in 1953 entered Balliol College, Oxford to read chemistry. His D.Phil. there was under the guidance of the renowned physical chemist, Mr Ronnie Bell, FRS and after its completion in 1959 he held a Fulbright Travel Award enabling further study under the equally renowned Frank Long at Cornell University, Ithaca, NY, USA. On his return he took up an Assistant Lectureship at the Manchester College of Science and Technology, then the Faculty of Technology of the Victoria University of Manchester, later becoming UMIST. He retired from UMIST in 2000 as a Senior Lecturer and Dean of Undergraduate Studies. There he had continued research on electrochemical cells and in 1977 published a monograph on Fuel Cells, but excelled in the other areas required of university lecturers, namely teaching and adminstration.

In addition to the normal range of undergraduate teaching, for which he was awarded a UMIST prize for excellence, he organised a Peer Assisted Study Session scheme to evaluate and help improve teaching by other chemistry department staff; was a leading figure in many staff training courses run by the Staff Development Unit of the University and became a member of the Institute for Learning and Teaching in Higher Education – an uncommon choice in research-driven academia.

His talents in committee and administrative work resulted in places on many University committees including the University Senate, its Standing Committee and at the highest levels in UMIST. In the chemistry department he was the Assistant Director of Laboratories from 1976 -1990 – an important

link to the undergraduate students – after which he served UMIST for 4 years as Associate Dean and then 6 years as Dean of Undergraduate Studies. Outside the department he was involved with student halls and residences, first as a tutor at Dalton Hall and then as Senior Advisor at Cornbrook House. He was a lifelong member of the Dalton-Ellis Hall Committee and the St Anselm Hall SCR.

Given his concern for, and involvement with, students, it was not surprising that, as an 80-year-old, he agreed to join and later chair the YP section committee of the Lit & Phil. During his time the committee continued its successful organisation of three lectures each year; changed the format to improve attendance and started a programme of improved contacts with the potential audience. He also made many contributions during his regular attendance at meetings of Council.

There were many outside interests including membership of the Manchester Statistical Society, of CAMRA, with the purchase of a copy of every *Good Beer Guide,* of the Halle Concert Society, the Labour Party and the University of Manchester Wine Club. For the last mentioned he arranged many unusual and challenging tastings. But his greatest interests were railways and travel and he was a member of 10 railway societies facilitating this interest. For one of the more significant of these, the Branch Line Society, he was chairman for 20 years from 1969. He records that he visited 51 countries including Malaysia, Australia and New Zealand and his only regret was that there were not more. Some of these were in organised trips to ride the spectacular, the unusual or the restricted sections of foreign railways. The exploration, investigation and photographic recording of railways, their buildings and signalling was a lifetime passion, perhaps initiated by the West Bridgford sounds. His railway legacy includes two books, many articles for railway society magazines and over 30,000 fully indexed photographs of railway track, station buildings, curiosities and, most significantly, a complete record of signal boxes within the UK.

My personal remembrance of Angus, whom I knew since 1963, is as a principled man, concerned for others, always excellent company, courteous and appreciative of the slightest kindness. Throughout his time he made many friends and retained them for life – from primary and secondary school, from the years at Balliol, from all his time in Manchester and from his wide range of activities – a truly remarkable number have enjoyed his friendship. Our lives have been enhanced by his presence and he will long be remembered.

Brian Tyler

Deaths occurring in the period July 1, 2018 to June 30, 2019

Mrs Rosemary Marsh (d.18 October 2018, Obituary vol. 156)
Rev Dr Richard Hills (d. 10 May 2019, Obituary vol. 156)
Mrs Dorothy Eagle (d. 31 July 2018)
Mrs Jean Isherwood (d. 27July 2018)
Professor Ian Isherwood (d. 3 September 2018)
Dr Geoffrey Jessup (d. 14 August 2018)
Professor Malcolm Chiswick (d. 8 February 2019)
Mrs Sheila Sharp (d. 8 April 2019)

Members will also be saddened to learn of the deaths during this period of the following members or ex-members for which we do not have a date of death:

Mr Roy Frost
Mr Stuart Kay
Mr David Brooks
Mr Peter Hewitt
Mrs Ruth Williams

Named Lectures 2018–19

A complete list of the Named Lectures prior to 2018 is given in volumes 151 to 156 of the Memoirs.

2018 October 15 **The Margaret Pilkington Memorial Lecture**
The Alderley Edge Landscape Project
156 pp 21-38
Professor John Prag

2019 February 14 **The McCurdy Lecture**
Battery and Electrical Storage technologies
Dr Gregory Offer

2019 March 19 **The Ramsden Lecture**
On you, Inside You: the amazing and horrible world of parasites
Professor Sheena Cruickshank

2019 May 15 **The Percival Lecture**
University cultural engagement in the 21st century
Alistair Hudson and Esme Ward

2019 June 6 **The Manchester Lecture**
Heritage, World Heritage and UNESCO: a view from the North-West of England
Henry Owen-John

Proceedings of the Manchester Literary and Philosophical Society

ANNUAL REPORT OF THE COUNCIL, 2018-2019

Lectures arranged by Council

During the 2018/2019 season there has been a series of very varied lectures featuring the wide breadth of interests of members of the Society, and often drawing in members of the public. There were six lectures, and several other events.

27 September 2018
'Men of Warrington': Influence and Deeds in North West England
Dr Diana Leitch MBE

The 2018 AGM of the Society took place on Thursday 27 September, followed by the first Council Lecture of the 2018-19 season, entitled 'Men of Warrington': Influence and Deeds in North West England. Dr Diana Leitch MBE, who had just handed over the Presidency to Dr Susan Hilton, presented a fascinating history of the men of this town, and their families, during the late 18th and early 19th century, when it was a thriving industrial hub. Names such as Barnes, Percival, Aikin and Gaskell all originated from Warrington, and were to influence the creation of institutions such as the Manchester Literary and Philosophical Society, further humanitarian causes and education in Manchester as well as to create one of the biggest foundries and chemical works in the NW region. The brothers, William and Samuel Gaskell, and their cousin, Holbrook Gaskell, all descended from sailcloth manufacturers in Warrington. Dr Thomas Percival and Reverend Thomas Barnes were two of the founders of the Lit and Phil (Percival was the Society's first President). Their relationship to Joseph Priestley, the Roscoe family, the engineer, James Nasmyth, and the builder of the Portico Library, David Bellhouse, were explored as was the influence of the Warrington Academy on them all. Samuel Gaskell FRCS, the younger brother of Unitarian minister William, husband of Elizabeth Gaskell, was a founder of the professional association that became the Royal College of Psychiatrists and gave his name to Gaskell House in Manchester. Many of their descendants also played a significant part in Manchester and the North West in general and leave lasting influences

25 October 2018
Modern Slavery and Human Trafficking – The Mass Exploitation of Human Misery
Sir Peter Fahy

On 25 October 2018, Sir Peter Fahy - Former Chief Constable Greater Manchester Police, and currently working with a number of charities, as well as being an Honorary Professor of Law at the University of Manchester, presented a lecture entitled 'Modern Slavery and Human Trafficking - The Mass Exploitation of Misery'. He outlined the often unseen victims of these growing crimes, which are partially being driven by the greatest mass movement of people the world has ever experienced driven, by conflict, population growth

and economic inequality, and was very clearly informed by his experiences as Chief Constable of Greater Manchester and his work with charities Retrak and Hope for Justice with victims in Africa. The estimates are that there are at least 40 million victims around the world, with 1.2 million in Europe. Case studies from Ethiopia and Uganda were given as examples, with consequences such as 48 Ugandans committing suicide due to their captivity.

Even in UK, there are problems such as workers in secret cannabis farms, waste recycling, etc. Accommodation is very often cramped, dirty, with extremely basic amenities, minimal income, and poor provision for basic nutrition. Personal documents such as passports are often withheld by employers, giving little chance to 'escape' from their appalling conditions.

In 2015 the government introduced the Modern Slavery Act, in order to protect highly vulnerable victims from this appalling abuse of their rights, and Sir Peter described how this is starting to have a positive effect. However, Sir Peter felt that we in the developed world still need to have a more radical and co-ordinated approach to hold back the tide of exploitation. He also outlined the way that the charities such as 'Retrak' and 'Hope for Justice' are working hard to promote awareness of Modern Slavery in the 21st Century.

19 February 2019

Polio – the Rocky Road to Zero

Professor Sir Liam Donaldson

On Tuesday 19 February 2019, we were very honoured to welcome Professor Sir Liam Donaldson, Chief Medical Officer for England, and the United Kingdom's Chief Medical Adviser, from 1998-2010. He had produced landmark reports setting health policy and legislation in stem cell research, quality and safety of health care, communicable disease control, patient empowerment, poor clinical performance, smoke free public places, medical regulation, and organ and tissue retention. He is now the World Health Organisation's Envoy for Patient Safety, Chairman of the Independent Monitoring for the Polio Eradication Programme, and amongst many other things, is Chancellor of Newcastle University.

Sir Liam's interest in the disease of polio began when, in 1953, a friend of his, at the age of 3, developed polio. In 1956, the injectable forms of vaccination against this tragic disease had just become available, and in 1962, the oral vaccine was introduced. Before that time, one could see pictures of long rows of children, each in an 'iron lung' keeping them alive, as their respiratory muscles had ceased to work. As more and more countries encouraged mass vaccination, the disease was almost eradicated worldwide. However, in the 1980s a goal was set by the World Health Assembly to permanently eradicate it in every country. At the start of the campaign, there were 350,000 polio cases worldwide, but by the late 2010s the figure was in the low 20s. However, in a few countries, the combination of conflict, terrorism, poverty and misinformation impede progress (Afghanistan, Pakistan and Nigeria being extreme examples). However, even in the poorer countries near-total eradication is still possible, given enough

enthusiasm – for example, in India, 174,000,000 children can be immunised in three days, these sessions being repeated several times a year. Sir Liam emphasised the highly infectious nature of the disease - one case of paralytic polio can infect between on hundred and over a thousand other individuals.

So, for the past 8 years, there has been a monitoring board, of which Sir Liam is the chairman, made up of representatives from 5 organisations – Rotary International, the World Health Organisation, the Bill and Melinda Gates Foundation, CDC (Centres for Disease Control and Prevention), and UNICEF. Polio is 99% eradicated, but the last 1% is great challenge, due to multiple factors. What of the future? Possible solutions were posed, but the key is education, and ownership of the importance of eradication of this disease by each country.

14 March 2019

The Dig Greater Manchester Community Project – Archaeology for all

Professor Michael Nevell

On Thursday 14 March 2019, the Society had the great pleasure of welcoming Professor Michael Nevell of the University of Salford, where he is Head of Archaeology, at the Centre of Applied Archaeology, in the School of Environment and Life Sciences. He has a special interest in the archaeology of the industrial period (industrialisation and archaeological theory, building archaeology, community archaeology, and Romano-British landscape), and is also, among many other things - author of at least 50 books and articles; Trustee of the Council for British Archaeology; Chair of the Association for Industrial Archaeology.

The lecture described how the 'Dig Greater Manchester Community Project' ran from 2011 to 2016. It aimed to provide local communities access to their own heritage through a variety of site and schools-based activities on Local Authority owned land within every borough of Greater Manchester (including Blackburn with Darwen). It also aimed to raise awareness of the past at a local community level and to promote its exploration by that community, whilst providing additional skills in accessing and interpreting heritage and building a sense of ownership and understanding. During its 5 years the project offered over 6500 schools places and 3000 community volunteer places to get involved in archaeology, including programs for groups not usually associated with archaeological projects.

The ideas for the project evolved from some previous research in 2000, when people of all ages who were involved in archaeological digs, were asked what they felt were the important elements of future digs. So, the objective of the project was to bring awareness to the public of the importance of archaeology, to encourage participation in an archaeological dig, and to understand the importance of what can be discovered on 'public land'. There were digs in every local authority in Greater Manchester (11 of them) initially, then more extensive areas were excavated in two of them. The project involved children from the primary and secondary sector as well those in further education, and

included a wide range of activities before, during and after the digs. There was particular emphasis on inclusion of every sector of society.

There was extensive feedback and analysis of the project, proving the long-lasting benefits gained by many participants, including benefits to physical and mental health. There were also many publications and press/media involvement. It was seen that local communities felt empowered to take ownership of their heritage in a very positive way, including the formation of and/or extension of several local archaeological societies.

15 May 2019

The Manchester Literary and Philosophical Society Percival Lecture

University cultural engagement in the 21-st century- case studies from the Directors of the Whitworth and Manchester Museum

Alistair Hudson and Esme Ward respectively

The Lit & Phil's annual Percival Lecture took place on Wednesday 15 May 2019, hosted by the University of Manchester (The Percival Lecture originated shortly after the Second World War, and now, Manchester, along with the University of Salford and the Manchester Metropolitan University sponsor this lecture on a rotational basis once every 3 years). We were very pleased indeed that this year the event took place in the beautiful Grand Hall of the Whitworth Art Gallery. We were very fortunate to have not one, but two very prestigious speakers – Alistair Hudson, the Director of the Whitworth and Manchester Art Galleries, and Esme Ward, the director of Manchester Museum. Both had taken up their posts in early 2018 and have some very exciting plans for their respective institutions. Their chosen title was as above, and we heard about how both the Art Gallery and the Museum are increasingly engaging with the citizens and students of Manchester, in ways which are relevant to the 21st Century, along with preserving our past heritages in both traditional and diverse ways.

Esme Ward spoke passionately about the history, and also the future of the Manchester Museum, which was originally opened in 1887, and now houses 4.5 million objects (greatest number in UK). The museum is widely used for teaching all ages, and for research. The aspiration is that by 2022, when current building work finishes, the museum will create co-working spaces for environmental charities that share their mission and vision for environmental education and action, and become the UK's most inclusive, imaginative and caring museum. Esme is also Strategic Lead for Culture for the GM Ageing Hub and, with their support, is developing the world's first Centre or Agency for Age Friendly Culture, to profile and share expertise and practice, build local and international partnerships and seek to influence sector thinking and policy around the value of culture to active ageing and generational cohesion. The Museum is currently working with many different cultural and ethnic communities to develop the new extension (entitled 'Hello Futures'), and this is working well.

Alistair Hudson also spoke with obvious enthusiasm about his plans for the Whitworth Art Gallery, and wants to imaginatively build on the recent wonderful development of the institution, and the very creative use of the space, alongside the surroundings of the adjacent park. He is very keen to promote the concept of 'useful art' – that art should be a tool for social change and education, and not just be an object of contemplation, though it is very important, of course, to maintain the latter. He emphasised that he wanted to attract all sections of society and all ages and make the Gallery as relevant as possible to the 21st Century.

6 June 2019
The Manchester Lecture
Heritage, World Heritage and UNESCO: A view from the North-west of England
Henry Owen-John

Our annual Manchester Lecture always features a speaker who is an expert in an aspect of the life of Manchester and the surrounding area, and we were very privileged to welcome Henry Owen-John on Thursday 6 June 2019, at the Manchester Conference Centre. He is an archaeologist by profession, and Head of International Advice at Historic England, the government's adviser on all aspects of the historic environment of England. This role involves him in providing advice to government and others on how the terms of international heritage conventions which have been ratified by the UK government can be met.

He started with the broader picture and explained the role of UNESCO's involvement in World Heritage. UNESCO (United Nations Educational, Scientific and Cultural Organisation) was founded in 1945, with the mission of creating a 'Culture of Peace and Non-violence', the central theme being 'peace'. There are 195 member states and it is based in Paris. UNESCO was tasked by The Hague Convention of 1954 to protect damage to cultural building caused by conflict. Examples of such sites were given, e.g. when Abu Simbel in Egypt was threatened to disappear by the Aswan Dam construction, the ancient monuments were moved to a higher site. UK examples of the current 1092 World Heritage Sites are the island of St Kilda, the Palace of Westminster, Ironbridge, and the Jurassic Coast. In total there are 31 sites in UK, and its independent territories. The process of applying to become a World Heritage Site was outlined, though sometimes the strict rules around the responsibility of being one can be impossible to maintain. For example, it was proposed that the city of Manchester should be a site, but the restrictions on new buildings would have been not economically viable. However, the Lake District is a new 'site', being inaugurated in March 2018, and UNESCO work closely with other organisations in that area, such as the National Trust – further details were given, especially the importance of community engagement and support. The City of Liverpool was admitted to the World Heritage list in 2004, and currently Jodrell Bank is the latest UK nomination, with the decision being made in July 2019.

Other Council Events during the 2018-19 season (Members only)

13 and 18 December 2018
Christmas 'Drop-ins' at the Lit & Phil offices on Deansgate. These 2-hour social events, with drinks and refreshments, went well. At the second one, we said good-bye to our two administrative staff, Julie and Kat, who were both leaving that Christmas after several years of loyal service. We also welcomed our two new staff Rachel and Aude.

27 March and 4 April 2019
Guided Tours of the Leonardo da Vinci Exhibition at the Manchester Art Gallery – 2 groups of over 24 members each time booked in for this very informative private tour of a fascinating insight into 12 of the original drawings of da Vinci, on loan to Manchester Art Gallery for a few months. We were led by a very experienced volunteer guide who gave a fascinating and detailed description of each of the precious sketches.

1 July 2019
Backstage Tour of the Royal Exchange Theatre, with a talk from their resident Elders Company and Elders Mondays scheme– 14 members attended this interesting backstage tour of the Manchester Royal Exchange tour, led by two of our very own Lit & Phil members, Stella Lowe and Anne Fitzpatrick, who are volunteer guides at the Royal Exchange. It was fascinating to hear a history of the theatre, and see the costume room, which has a very busy schedule of 4-5-week preparation time for each production, often creating original costumes from designer's drawings. We also saw the wig department, along with samples of various gruesome body parts, and use of theatrical 'blood'! We then heard all about the enterprising 'Elders Company' which attracts over-50s from the local community and has been very successful, as well as the open access 'Elders Mondays' (see their website).

25 July 2019
Guided tour of Manchester's 'Churches Past and Present', with Andrew Derbyshire, a very experienced and knowledgeable Manchester guide – A group of 15 members were present, on the hottest day of the year (several others were unable to make it that day). We started at Manchester Cathedral, which stands on the site of the original 7th Century building, though very much rebuilt over the centuries since. In 2021 it will be 600 years since Henry V signed the charter to establish it as a collegiate church. Andrew then walked us chronologically past the significant buildings and sites of religious activity in the area, past Chetham's School and library, into Salford where the significance of the Sacred Trinity Church was explained, through to the banks of the Irwell, back over to Parsonage Gardens and the origins of that name, past the site of St. Mary's Church (now gone), on to St. Ann's Church in the square of that name, up to the Cross Street Chapel (Unitarian), and on to Albert Square. We then walked past the Friends Meeting House (where the Quakers meet), viewed the Hidden Gem (Roman Catholic), and ended outside John Rylands Library, where there

are many rare Christian artefacts as well as books. It was an informative and enjoyable tour, rounded off with lunch at the Lit & Phil rooms at Church House.

5 August 2019

Tour around the new Royal Horticultural Society's garden 'RHS Bridgewater' – The garden is in the final stages of construction, and this was a specially arranged pre-opening look at progress so far – 19 members were shown round by two very knowledgeable guides (one of whom had played in the gardens as a child!). Over the 2-hour visit we were informed about the history of the site, and that the gardens had lain mostly unmanaged for over 100 years (there had been a Garden Centre for a few years and also the Scouting Movement had held camps there in the recent past). The Hall had been demolished in 1949 after many years of neglect. Therefore, we were asked to use our imagination (with the aid of maps and photos) as to how the original magnificent Worsley 'New' Hall and Gardens must have looked at one time, with a view over manicured gardens and the surrounding area. The Earl of Ellesmere and his family had owned it and lived there occasionally. When the RHS took it over about 3 years ago it was a jungle of self-seeded trees and plants, with deer roaming freely (some still do, as we saw from the hoofprints as we went around!). However, over the last 2 years amazing efforts have been made and the Phase 1 clearing, building and replanting work is well under way, to transform the place into the largest walled gardens in Europe, with the initial opening to the public planned for 2020. Many specialist, educational, and therapeutic parts of the gardens are in active progress and we felt very privileged to be able to see what is happening there, right on or doorstep, and for the benefit of all the residents of Greater Manchester and beyond.

Dr Susan R Hilton M.B. Ch. B., DRCOG, MA, FPPH

Lectures arranged by the Arts Committee

We have endeavoured to offer a range of lectures across the spectrum of the Arts. A summary of our 2018-19 season's programme is below.

15 October 2018
The Alderley Edge Landscape Project
Professor John Prag

A fascinating look at the rich complex history of geology, archaeology, early mining and social history, of Alderley Edge. This was also the Margaret Pilkington Memorial Lecture – a tribute to the first Chair of the Arts Committee when it was founded in 1970, and the L&P's first woman President.

8 November
Art on Death Row
Mary Vaughan

The lecture reviewed the motivation and difficulties of death row artists in the USA and showed some of their work. Following the lecture, the L&P was presented with a beautiful work of art donated to the Society by one of those artists.

4 December
Women Artists, their emergence into the light
Christine Musgrove

The lecture charted the place of women in art from medieval times to the present day, highlighting how women artists highly regarded in their life-time were written out of art history in the 19th and 20th century – but how social attitudes have changed that view so that women have emerged with recognition as artists, curators, art historians and policy makers.

29 January 2019
Film Poetry: Humphrey Jennings and British Wartime Propaganda
Dr Alan Sennett

The lecture asked whether propaganda can be poetic, exploring two of Jennings' Film Unit Productions.

27 February 2019
A Grand Gothic Magic Lantern Entertainment
Dr Jeremy Brooker

A talk on the history of the magic lantern as a form of popular entertainment followed by a magic lantern show featuring a Victorian triple lens lantern and original hand-painted slides.

On 1 May and 23 May 2019 we commemorated Peterloo. The first event was in two parts – words and music from the Free Radicals and a look at this event through a graphic novel, with the narrative taken directly from original historical sources, by Dr Robert Poole, Paul Fitzgerald and Eva Schlunke. The second

event was a guided walk, visiting the site of the massacre, with tour guide Ed Glinert, followed by refreshments and a Q and A session at our headquarters – Church House on Deansgate.

The Arts Section has also organised a number of theatre visits to the Royal Exchange with refreshments and a talk beforehand at Church House, plus the chance to discuss the plays afterwards, over coffee.

Patricia McWilliam-Fowler
Chairman - Arts Committee

Lectures arranged by the Science and Technology Committee

This session has been an active one for the committee: we have implemented the 2018-19 programme that was developed last year, and we have planned the programme for 2019-20. In addition to these basic activities we have 'established' afternoon seminars in the Small Conference Room of the Lit & Phil in Church House.

The 2018-19 Programme has run very effectively, with some quick manipulation to ensure each slot is filled - as far as members are concerned it has progressed like a swan, but there was a lot of paddling going on beneath the surface. You will see that the committee actually supported seven talks when the basic allocation was for six lectures. The lectures are listed below:

9th October 2018
Climate's Holy Trinity: how cogency, tenacity and courage could yet deliver on our Paris 2˚C commitment
Kevin Anderson

This was a typically controversial delivery that put in context the fact that Climate Change must be treated as a Worldwide problem that knows no physical boundaries. By chance the lecture was given the day after the publication of the IPCC Special Report "Global Warming in 1.5℃"

30th October 2018
The Elimination of Cervical Cancer by 2050 - reality or blissful thinking
Margaret Stanley

The lecturer described how most/all cases of cervical cancers are caused by variants of the human papilloma virus (HPV). She explained how a vaccine could make women in the developed world resistant to the virus (still a disease with a significant death rate in UK). She then described the difficulties of vaccinating women in developing countries, where the mortality rate is unacceptably high. The presenter also emphasised that the vaccine should also be given to men.

27th November 2018
Air Pollution and Public Health: emerging hazards and improved understanding of risk
Frank Kelly

This lecture was extremely topical following the 'dieselgate' scandal of false readings from automobile tests. The presenter showed that while the physical size of particulates from many sources had decreased significantly their effect on human health had not. This was basically because small particles (about 2.5micron) could progress deeper inside the lung. Also, while researchers had tended to concentrate on exhaust particles many others were now becoming important (brake dust, tyre dust, etc).

11th December 2018
Predictability beyond the Weather Forecast
Adam Scaife

The presenter showed that it is possible to predict year to year differences in average weather well in advance, especially for winter seasons. The predictions are based on an average of many simulations, each starting from different early November conditions. This demanding operation required the use of the Met Office supercomputer. It was discovered although each run does not reliably predict the late winter conditions the average of over 20 runs does. This ability to see these trends is useful for the transport industries, and energy utilities.

14th February 2019
Battery and Electrical Storage Technologies: the next generation of energy storage
Greg Offer

The speaker described recent and current work by his large research group which involves industry as well as academia. He warned of the unreality of headlines promising revolutionary advances: in practice there are incremental changes that accumulate to produce significant progress. In fact, most "breakthroughs" are based on 20-year-old research. It is now expected that battery powered electric vehicles will dominate the mass market for transport in the future as batteries rapidly become cheaper. This change is also driven by the need for emission improvements. China will be a major player in the global market and cobalt supply may be a critical factor. His final slides covered the opportunities for improvement in existing technology and potential developments, discussing possible "disruptions" and the opportunities from this, especially for newcomers in existing markets.

6th March 2019
Genomics – the power to revolutionise healthcare
Bill Newman

Newman said that of some 8000 rare diseases (<1 in 2000 people affected) about 80% are genetic and the result of single gene abnormalities but genetic testing is available for less than 1000 of these. Making a genetic diagnosis can

remove diagnostic uncertainty and direct appropriate clinical investigation as well as preventing unnecessary investigations.

Broadly speaking genetic disease may be the result of rare mutations of major effect leading to single gene, which might require the sequencing of the whole genome (WGS). Initially, it took 13 years and over £2 billion to sequence the whole genome (or most of it). It is estimated that the cost of WGS is about $1000 now, and it can be accomplished in a day or two. The speaker summarised by emphasising that the very rapid advances which have been made in recent years have been dependent on phenomenal developments in DNA sequencing technology and a corresponding reduction in cost. He cautioned that the significance of many genetic variants is still unclear and that a given variant does not always have the same impact in different individuals. Nevertheless, responsible application of genetic technology has the potential to transform healthcare.

8th May 2019

Thinking like a Vegetable – how do plants decide what to do?

Ottoline Leyser FRS

Plants seem to have an uneventful life, literally, 'rooted' to the spot; however, they are intelligent 'beings' that have an ability to adapt in ways animals cannot imagine. This static existence means they cannot run away when 'attacked' by predators, so it is appropriate to have a distributed processing system - rather than a single brain like an animal. It is this distributed, more democratic, processing system that has been examined by the lecturer. Leyser explained that plants need to 'analyse' their environment and respond accordingly. Plant growth is controlled by meristems at the tips of growth, and plants can activate or repress these via a plant hormone called auxin, produced at the tip of the plant. Leyser then explained that plants allocate their resources to maximise the number of 'grandchildren' in an unpredictable world. This results in them having flexible growth habits; but these properties do not align with human requirements, which want the resources to maximise the harvested part (e.g. seed). This brings about a less flexible growth habit; digestible, nutritious seed, which is retained on the plant and maximally resourced. An excellent example of how humans have modified a plant is corn on the cob: the natural plant has a small seed head, whereas the cultivated plant produces a large head with large seeds.

In addition to these traditional presentations the section has sponsored two seminars. These were:

2 October 2018

Solid, liquid and vapour – where do you draw the line?

John Proctor

It was held in the Small Meeting Room in Church House on the afternoon of and attended by 20 members of the Society. The presenter described the conventional understanding of the three states of matter and then gave an account of recent work by himself and others of new discoveries, understanding and modelling of fluid behaviour under extremes of pressure and temperature.

8 May 2019
The two cultures revisited: reframing the post-truth society
Dame Ottoline Leyser

This was held in the SMR at Church House. It was attended by about 20 members. Dame Ottoline developed the theme originally discussed by CP Snow that there was a gulf between those practising the sciences and arts.

You can see from the above report that we have had an active year. We felt we had put together a relevant, contemporary programme demonstrating the major areas exercising scientists and technologists: this has been reinforced by the number of times our presenters have been called upon by the media to comment on developments in their subjects. We have been extremely lucky that people have been willing to give freely of their time to keep us informed about their subjects.

Finally, I must thank all members of the committee for their help in bringing together the programmes and then ensuring that they are executed efficiently. I like to feel that we have operated as a team with me acting primus inter pares. We will be losing two longstanding members of the committee because their terms have come to an end.

Michael Sinnott who was Chairman before me. Mike made a tremendous contribution to the committee and its programmes, both by introducing many subjects in the life sciences and, lately, writing extremely erudite reports on lectures. We hope that Mike can continue to help us as a corresponding member.

Brian Tyler who has been Secretary during both Mike Sinnott's and my term as Chairman. Brian has been the person who has ensured a disorganised Chairman can appear to be in charge - I have a horrible feeling he will be able to state 'après moi, le déluge'.

Desmond Winterbone, FREng
Chairman - Science and Technology Committee

Lectures arranged by the Social Philosophy Committee

We began our season early this year as one lecturer, **James Burke**, lives in France and it was necessary to pick a date when he was already visiting the UK. Under the title ***The Future Isn't What It Used to Be*** he talked, in September, about his 'Knowledge Web' which links people and ideas throughout time and locations.

In September **Sir David Dalton** spoke to members on ***The NHS at 70*** describing its origins and its developments and then took a brief look at its future.

In November **Mrs Angela Bebb** opened the archives of her company, Universal Aunts, to provide an interesting view of ***A Social History of Women between the Wars***. She described the changing values of society mirrored in the types of work the agency was asked to carry out - from escorting children to their boarding schools, providing housekeepers and butlers and creating a flying school for ladies to transporting a poodle from London to Korea.

In some contrast to this, **Jane Davies OBE** addressed the Society in early January on ***Building a Knowledge Economy*** where she looked at how a knowledge economy works, what the roles of science parks and areas of innovation are and how their business models work. She focussed on Manchester and Belfast and looked at how their approaches differ.

In late January we heard **Dr Zoe Wyrko** lecture on ***Intergenerational Learning*** which concentrated on a Channel Four programme in which she led an investigation into how older adults and younger children can help each other. She described how each was able to help the other and on the way our society views ageing and what must be done to change those views in order to benefit all ages.

Finally, in March, we were visited by **Nick Card**, the senior projects manager at the Orkney Research Centre for Archaeology. His title was ***Secrets of the Ness of Brodgar*** which is a stone-age complex in the heart of Neolithic Orkney World Heritage Site. He described the work carried out there showing how it has opened the eyes of the world on how our Neolithic ancestors lived.

Peter Barnes
Chairman - Social Philosophy Committee

Lectures arranged by the Young People's Committee

Following comments last year, we scheduled all of our lectures this year to take place before Easter, in order to avoid the schools' examination preparation period. Members of the Committee have talked to groups of pupils at several local schools for their opinions on suitably attractive topics and also on timing. These discussions have been very instructive.

As usual we had three events this year.

On 12 November, **Professor Tony Freemont**, Clinical Professor of Bone and Joint Pathology at the University of Manchester, made a welcome return visit, this time giving a lecture on ***Osteoarthritis: how new 'precision medicine' will cause a revolution in the management of an old disease.***

He focused on osteoarthritis and new ways of investigating and treating this very common condition. He bravely delivered the lecture, while balancing on a very innovative crutch, having a few weeks earlier had an operation on his own foot – to treat his own osteoarthritis – and talked about how he had developed his particular condition – genetically, and also from extreme weight-bearing exercise in earlier life.

He described different ways of looking at cell and molecular biology, advances in biomechanics, regenerative medicine, biomaterials, nanotechnology, and personalised medicine. These will be realities in the near future, as part of the management of osteoarthritis, with much more emphasis on genomics.

On 4 February **Professor David Hornby,** of the Department of Molecular Biology and Biotechnology at the University of Sheffield, spoke on ***Molecular Surgery with CRISPR-Cas9***. He explained in detail this complicated topic,

"Clustered Regularly Interspersed Short Palindromic Repeats" which concerns the bacterial control of viral infections. Cas9 is an enzyme which enables bacterial defence against disease and, as such, suggests a promising development in molecular medicine. It was a complicated but fascinating story.

Finally, on 19 March **Professor Sheena Cruickshank**, Professor in Biomedical Sciences and Public Engagement at the University of Manchester, gave the Ramsden Lecture "***On You, Inside You: the amazing and horrible world of parasites***. For the squeamish this was perhaps an unwelcome revelation about parasites affecting many of us (although sometimes without obvious deleterious effect). She extended her topic to include parasites on animals and even plants, which also led to some rather distasteful (though fascinating!) illustrations. Parasites, which of course derive their life support from their hosts, range in size from the minute (an eyebrow parasite) to quite large (a tape worm).

All of these events had a very good attendance from Young People, many of whom posed excellent questions to the speakers. As in previous years we arranged pizza and a drink to be available to the Young People before each lecture as well as a supper for members and guests afterwards.

It has been pointed out to us that the first Young People lecture took place on 5 January 1921, and we are considering how best to celebrate the centenary of this event.

I am grateful to members of Council and the Committee for their help during my time in hospital and convalescence.

Angus McDougall
Chair - Young People Committee

Treasurer's Report

The Statutory Accounts presented here comply with the Charity SORP (FRS 102). To aid members understanding of these accounts, I have included in my report a detailed Income and Expenditure Statement for the year ended 30 June 2019.

Overall 2019 was a year of transition. In December we saw the departure of both of our office staff and the arrival of two new staff. Both were recruited with a view to reviewing our operation and looking for ways to raise the profile of the Society and attract new members. In the second half of the year we saw an increase in expenditure on promotional and marketing activities as well as salaries for the new staff as part of our new strategy. Clearly at this stage in terms of 2019 results it is too early to tell if our new approach will generate additional income but this is something we will be monitoring during 2019/20.

Another change we saw during 2019 was a revision of our investment strategy. At our review meeting with our investment advisers Brewin Dolphin, we gave a clear instruction that the Society would look at returns from our investments both in terms of income generated and capital appreciation, not just income. This provided them greater flexibility in terms of their investment decisions for our portfolio. During 2019 we saw a reduction in income from our investment but an increase in the value of our portfolio's capital value. We intend to pursue this strategy in the best interests of the Society.

Paying Member numbers remained at a similar level in 2019 to 2018 which combined with a 4% increase in our subscription rate for the year, saw a small increase in subscription income. Whilst this is a satisfactory position, we still want to increase our paying membership base. This is something we will continue to work towards during 2020.

Therefore, whilst an increase in our deficit in 2019 compared to 2018 is at first sight disappointing when taken in context of above comments and our ongoing control of Society running costs we can take satisfaction from our performance for the year.

Trevor Rees
Honorary Treasurer

The Manchester Literary & Philosophical Society
Income and expenditure account for the year ended 30 June 2019

	2019	2018 £
INCOME		
Subscriptions and Gift Aid	30,427	29,371
Investment income	41,560	44,337
Donations and legacies	313	75
Sundry Income and Donations	165	111
TOTAL INCOMING RESOURCES	72,465	73,894
EXPENDITURE		
Function costs		
Functions and meeting costs	16,624	15,668
Printing of Memoirs and Programmes/ Promotional Expenses	5,775	3,926
	22,399	19,594
Office costs		
Rent and services charges	14,536	13,042
Heat and light	260	565
Website	2,507	2,081
Maintenance /office improvements	1,319	1,898
Staff costs	32,729	28,385
Library	-	-
Stationery and photocopying	1,493	1,585
Postage, telephone and equipment hire	1,589	2,036
Insurance	1,875	1,974
Depreciation	-	1,098
Sundries	1,062	292
	57,370	52,956
Society costs		
Legal and professional fees	964	1,064
Independent examination fee	2,400	2,493
Investment management fee	9,915	9,986
Bank charges / PayPal	895	861
	14,174	14,404
TOTAL COSTS	**93,943**	**86,954**
Net operating (deficit)/surplus	**(21,478)**	**(13,060)**
Net investment gains	**33,921**	**23,534**
Net Movement in funds	**12,443**	**10,474**

The Manchester Literary & Philosophical Society
Balance Sheet for the year ended 30 June 2019

	2019 £	2018 £
Fixed Assets		
Tangible assets	-	-
Investments	1,481,716	1,452,760
Investment in Subsidiary	100	100
	1,481,816	1,452,860
Current Assets		
Debtors	-	-
Tax repayment due	-	5,365
Prepayments and accrued income	1,116	1,223
Cash at bank and in hand	36,683	47,117
	37,799	53,705
Creditors: Amounts falling due within one year	(8,307)	(7,700)
Net Current Assets (Liabilities)	29,492	46,005
Net Assets	1,511,308	1,498,865
Funds of the Charity		
Unrestricted funds		
Expendable endowment fund	1,511,308	1,498,865
Total Funds	1,511,308	1,498,865

The charity was entitled to exemption from audit under section 477 of the Companies Act 2006 relating to small companies.

The trustees / directors acknowledge their responsibility for complying with the requirements of the Companies Act 2006 with respect to accounting records and the preparation of accounts.

The above statements have been extracted from the Annual Report and financial statements which were approved and authorised for issue by the Trustees at a Council meeting held on 19 August 2019 and signed on its behalf by:

P HILTON Secretary
T REES Treasurer

Company Registration Number 933
Registered Charity Number 235313

Honorary Librarian's Report

The listing of the contents of the boxes in the archives has continued and this is useful in locating material to help with answering the queries which continue to be received online. It has been decided to discontinue the card file of Named Lectures since having the list in the Memoirs is an important printed resource which is more generally available for consultation.

Christine Chappelle
Hon. Librarian

Officers and Council 2018–2019

President
Susan Hilton

Immediate Past President
Diana Leitch

Vice-Presidents
Chris Baker Tony Jackson

Honorary Secretary
Peter Hilton

Honorary Treasurers
Trevor Rees Greg Mauchline

Honorary Librarian
Christine Chappelle

Honorary Memoirs Editor
Graham Booth

Members of Council
David Shreeve*, Netar Malik*, David Brailsford, Chris Boyes, Ronald Catlow, Joanna Lavelle, Kenneth Letherman, Patricia McWilliam-Fowler, Desmond Winterbone, Peter Barnes, Angus McDougall

SECTION OFFICERS

Arts
Chair: Patricia McWilliam-Fowler
Minutes Secretaries: Tony Jackson, Joanna Lavelle

Science & Technology
Chair: Desmond Winterbone
Secretary: Brian Tyler

Social Philosophy
Chair: Peter Barnes
Secretary: Philip Hulme

Young People's
Chair: Angus McDougall
Secretary: Diana Leitch

Administrators
Aude Nguyen Duc Rachel Croft

*resigned 27/09/2018

Presidents of the Society

Date of Election	
1781	Peter Mainwaring, MD; James Massey
1782-1786	James Massey, Thomas Percival, MD FRS
1787-1789	James Massey
1789-1804	Thomas Percival, MD, FRS
1805-1806	Rev George Waler, FRS
1807-1809	Thomas Henry, FRS
1809	*John Hull, MD, FRS
1809-1816	Thomas Henry, FRS
1816-1844	John Dalton, DCL, FRS
1844-1847	Edward Holme, MD, FLS
1848-1850	Eaton Hodgkinson, FRS, FGS
1851-1854	John Moore, FLS
1855-1859	Sir William Fairbairn, Bart, LLD, FRS
1860-1861	James Prescott Joule, DCL, FRS
1870-1871	Edward William Binney, FRS, FGS
1872-1873	James Prescott Joule, DCL, FRS
1874-1875	Edward Schunck, PhD, FRS
1876-1877	Edward William Binney, FRS, FGS
1882-1883	Sir Henry Enfield Roscoe, DCL, FRS
1884-1885	William Crawford Williamson, LLD, FRS
1886	Robert Dukinfield Darbishire, BA, FGS
1887	Balfour Stewart, LLD, FRS
1888-1889	Osbourne Reynolds, LLD, FRS
1890-1891	Edward Schunck, PhD, FRS
1892-1893	Arthur Schuster, PhD, FRS
1894-1896	Henry Wilde, DCL, FRS
1896	Edward Schunck, PhD, FRS
1897-1899	James Cosmo Melvill, MA, FLS
1899-1901	Horace Lamb, MA, FRS
1901-1903	Charles Bailey, MSc, FLS
1903-1905	W. Boyd Dawkins, MA, DSc, FRS
1905-1907	Sir William H. Bailey, MIMechE
1907-1909	Harold Bailey Dixon, MA, FRS
1909-1911	Francis Jones, MSc, FRS
1911-1913	F.E. Weiss, DSc, FRS

1913-1915	Francis Nicholson, FZS
1915-1917	Sydney J. Hickson, DSc, FRS
1917-1919	William Thomson, FRSE, FCS, FIC
1919	G. Elliot Smith, MD, FRS
1919-1921	Sir Henry A. Miers, DSc, FRS
1921-1923	T.A. Coward, MSc, FZS, FES
1923-1925	H.B. Dixon, CBE, PhD, FRS, FCS
1925	†Rev A.L. Cortie, SJ, DSc, FRAS, FInstP
1925-1927	H. Levinstein, DSc, MSc, FIC
1927-1929	W.L. Bragg, OBE, MA, FRS
1929-1931	C.E. Stromeyer, OBE, MInstCE
1931-1933	B. Mouat Jones, DSO, MA
1933-1935	John Allan, FCS
1935-1937	R.W. James, MA, BSc
1937-1939	R.H. Clayton, MSc
1939-1940	D.R. Hartree, PhD, MSc, FRS
1940-1944	H.J. Fleure, DSc, FRS
1944-1946	M. Polanyi, PhD, DSc, MD, FRS
1946-1948	T.B.L. Webster, MA
1948-1950	E.J.F. James, DPhil
1950-1952	H. Hayhurst, FRIC, AMIChemE, FRES
1952-1954	Sir Geoffrey Jefferson, CBE, LLD, FRCS, FRS
1954-1956	P.F.R. Venables, PhD, FRIC
1956-1958	F.C. Toy, CBE, DSc, FInstP
1958-1960	C.E. Young, MSc
1960-1962	H. Lipson, DSc, FInstP, FRS
1936-1964	L.Cohen, BCom, FBIM
1964-1966	Margaret Pilkington, OBE, MA, FMA, JP
1966-1967	H. Hayhurst, MSc, CEng, FRIC, AMIChemE, FRES
1967-1969	Brian Rodgers, BSc(Econ)
1969-1971	G.N Burkhardt, PhD, FRIC
1971-1973	G.J. Kynch, PhD, MScTech, ARCS, DIC, FIMA
1973-1975	E.N. Abrahart, PhD, FRIC, FSDC
1975-1977	A.E.R. Goulty, MA
1977-1979	H. Lipson, CBE, DSc, FInstP, FRS
1979-1981	H.M. Fairhurst, MA, FRIBA
1981-1983	D.G. Wilson, OBE, DL, FIB, FBIM
1983-1985	L.J. Postle, PhD, FInstP, FInstMC

1985-1987	Sir Netar Mallick, MB, ChB, FRCP
1987-1989	B.S.H. Rarity, PhD, FRAS
1989-1991	P.G.Livesey, FCA
1991-1993	D.S.L. Cardwell, PhD
1993-1995	E.F. Cass, MA, ACIB
1995-1997	A. Donnachie, PhD, CPhys, FInstP
1997-1999	Dianne Wilson
1999-2001	I.E. Gillespie, MD, MSc, FRCS
2001-2002	A.G.D. Yeaman, JP, CEng, MIMechE
2003-2005	K.D. Buckley
2005-2007	Vivienne Blackburn, BSc
2007-2009	Mary, Lady Mallick, JP, BA
2009-2011	David J Higginson, LLB
2011-2014	Kenneth M Letherman, BSc, MSc, PhD, DSc, CEng, FIEE
2014-2016	Sir Netar P Mallick, BSc, MB, ChB, FRCP
2016-2018	Diana M.Leitch BSc, PhD, FRSC, MBE
2018-	Dr Susan R Hilton M.B. Ch. B., DRCOG, MA, FPPH

* Elected 28 April, resigned office 5 May 1809
† Died 16 May 1925

Honorary Members

As at 30 June 2019

1990	Professor Sir J M Ashworth
2017	Mrs A Boulton
2017	Mrs H Bradshaw
1989	Mr M N G Evans
1968	Reverend Dr R L Hills
2013	Professor L Merrick
1999	Professor Sir G Prance
1990	Sir M Richmond
2013	Professor Dame N Rothwell FRS
1994	Sir R Scott
2004	Dame J Smith
2015	Dr T Sommer
2017	Mr P Wilson

Elected Corresponding Members

As at 30 June 2019

1972	Professor A Thackray
1946	Mrs R Williams

The Dalton Medal

The Dalton Medal is the Society's highest award and a distinction only rarely bestowed. It is given to those who have made a distinguished contribution to science.
The Medal has been awarded to:

1898 Edward Schunk, FRS
1900 Sir Henry E Roscoe FRS
1903 Professor Osborne Reynolds FRS
1919 Professor Sir Ernest Rutherford, OM, FRS
1931 Sir Joseph J Thomson, OM, FRS
1942 Sir Lawrence Bragg, CH, MC, FRS
1948 Professor P M S Blackett, OM, FRS
1966 Professor Sir Cyril Hinshelwood, OM, FRS
1981 Professor Dorothy Hodgkin, OM, FRS
1997 Professor Sir Harold Kroto, FRS
2002 Sir Walter Bodmer, MA, PhD, FRCPath, FRS
2005 Professor Sir Roger Penrose, OM, FRS
2009 Professor Sir Bernard Lovell, OBE, FRS
2012 Professor Lord Martin Rees, OM, Kt, FRS
2016 Professor Sir Konstantin Novoselov, FRS, FRSC, FInstP

Ordinary and Corresponding Members as at 30 June 2019

* Denotes corresponding members † Deceased

We are not including Members' addresses due to the requirements of the Data Protection Act, but these are being published in a separate booklet for Members.

2018 Dr L Adab
2014 Mr J W and B Adams
1955 Mrs M E Ainsworth
1989 Professor S T S Al-Hassani
2019 Ms R Alvarez-Diaz
2018 Dr K Amano
2000 Mrs J E Argust and Mr J P Argust
2009 Mr D Astbury
2017 Dr Dianne Bamber
2008 Mr G Baker and Mrs C Baker
2008 Mr C E J Baker and Mrs J Baker
2011 Dr R Baldwin and Mrs C Baldwin
2018 Mr R Bardsley
2002 Mr N P Barnes
2018 Dr A Berry
1986 Mr P K Berry
2019 Mrs M Bhavnani
2008 Professor J G Booth and Mrs M C Booth
1991 Mrs A Boulton
1999 Mr C J Boyes
2008 Mr I Bradford
2004 Mrs H Bradshaw
2003 Mr D Brailsford
2009 Mr J Brandrick
2019 Ms J Brockenshaw
2011 Mr M R Brown
1990 Mr K D Buckley and Mrs N Buckley
2018 Mrs I Burger
2009 Dr C Burke
1985 Dame Sandra A V Burslem
2018 Mr A Burton
2017 Miss V Byrne
2010 Mr I C and Mrs S Cameron
2009 Mr N O Campbell
1981 Mr J L Carroll*
2015 Mrs H Carter

2012 Dr M Carter
1981 Dr R E Catlow
2012 Mr J Cave
2017 Ms A Chaouch
2011 Mr R Chiverton
2017 Mrs J Corbett
2010 Mr B C Crebbin
2013 Dr M Cunningham
2018 Dr D Daji
2010 Dr W Darlington
1968 Mr J H W Davidson
2012 Mrs J Davies and Mr W Davies
2009 Professor J K Davies
2016 Dr S Davies
2017 Dr T Daya-Winterbottom*1959
1959 Mr D H de Maine †
2004 Dr A Deiraniya
2018 Mr Brian Derby
2013 Professor M Desai
1986 Professor A Donnachie and Mrs D Donnachie
2006 Dr P Donnelly and Mrs A Donnelly
2019 Miss D Drehmer
2013 Mrs E Dyson
1978 Mr J C Eagle
2010 Ms B Eliot
1984 Mr T A Elliot
1994 Professor M Elstein and Mrs C Elstein
2013 Dr N Emekwuru
1988 Mr P Emerson Jones
1989 Mrs J Evans
1983 Professor P G Farrell*
2015 Ms S Faulkner
2012 Dr P Fenn
2010 Mr F L Fernley
2004 Mrs A Fitzpatrick
2015 Professor J Frame
1990 Mr R Frost †
2017 Dr P Fyans
2011 Professor C Galasko
2013 Mr D Gane
2018 Mr J Glenn
2017 Dr I Gostimskaya
2015 Mr M Gourley
2011 Mr I W Grant and Mrs A M Grant
2007 Professor J Green

1994 Mr S H Halsall and Mrs M Halsall
2010 Mr M Hancocks
2019 Dr F Hashmi
2016 Dr J Hassall
2018 Mrs A Hassan
2003 Mr G Hayes †
2009 Judge T B Hegarty and Ms I L Hegarty
1989 Professor J R Helliwell
2018 Miss K Heung
2009 Miss G Heyworth
1989 Mr D J Higginson
2011 Mr R and Mrs E B Hill
1986 Mr P G Hilton and Dr S R Hilton
2018 Mr P Holden
2009 Mr B Hooley
2014 Mr J Horner
2009 Mr J Howell
2015 Mrs J Howells
2006 Mr P E Hulme
2012 Mr M Hunt
2016 Mrs H Hůlová-Sharpe
2010 Professor A R Jackson
2001 Mr J S Jackson and Mrs M Jackson
2009 Professor J D Jackson and Mrs L A Jackson
2013 Mr T Jackson-Baker
2018 Ms N Jaeger
2018 Dr I Jafarian
1991 Professor M I V Jayson
2010 Mr D W Jenkins
2018 Dr D Johnson
2017 Professor N Jones
2007 Mr L Jowsey and Mrs D Jowsey
2018 Mrs V Kelly
1997 Mr M P Kershaw and Mrs E Kershaw
2010 Professor P M Kumar
2010 Mrs J Lavelle
2007 Mr M J Lees
1988 Mr W R Lees-Jones
2008 Dr D Leitch and Dr D M Leitch
2003 Professor K M Letherman and Mrs R Letherman
2010 Mr R Lewis
2012 Mr G Lloyd and Mrs J Lloyd
2015 Mrs M Lord and Mr P Lord
1962 Miss S J Lowe
2017 Dr K Lucas

1990 Mr N M MacPhail
1981 Mr C E Makepeace and Mrs H Makepeace
1999 Dr P J Makin
2010 Mr C Malkin and Ms C Brice
1975 Professor Sir N Mallick and Lady M Mallick
2016 Mr D Martin
2009 Dr M A Martin
2013 Mr G Mauchline
2017 Mr R G Maund
1983 Mrs M McCauley
2010 Dr A McDougall†
2018 Dr M McDowall
2017 Dr A McNab
2013 Mrs P McWilliam-Fowler
2019 Mrs S Miguel
1988 Dr J P Miller
2004 Mrs G Mitchell
2012 Mr D Morris
2016 Mr A and Mrs H Morris
1988 Dr J J Moscrop and Ms C Orgell-Rosen
2002 Dr J G Mosley and Mrs J Mosley
2018 Ms K Mure
2017 Mr B Murphy
2001 Mr J D Naylor
2009 Mrs Y Neild
2018 Mr S Nemir
1997 Dr P Newton and Mrs K Newton
2007 Mr J O'Neill
2016 Mr G Palmer
2013 Mr D Peat OBE
2019 Mr T Phelan
2018 Mr A Pickwick
2001 Mrs B Piper
1981 Dr J E B Ponsonby
2014 Mr R Poole
1986 Dr T Porter and Mrs MR Porter
2013 Mr A Postill
1985 Reverend Dr W P Povey
2018 Mr N Power
2008 Mr D Poyner and Mrs J Poyner
2011 Mr S Procter and Miss C Rigg
1982 Mr F R Purslow
1981 Mr R C Rees
2016 Mr T Rees
2018 Mrs M Repanos

2002 Professor B Richards
2004 Mr W N B Richardson
2017 Mr A B Riley
2014 Mr J A Riley
1981 Professor T E Roberts
1966 Professor A C Rose-Innes and Mrs B Rose-Innes
2006 Mr I A Ross
2007 Mrs E M Ross
1983 Mr R K Ross
1992 Dr P Rowlands
2004 Mr P Rubery
2005 Mr M R Sanderson
2008 Dr R Sandler and Mrs L Sandler
1971 Mr M H J Sargent
2008 Dr C Saunders
2018 Mr V Sheedy
2015 Professor P Shenton
2011 Dr D R Shreeve
2010 Professor M L Sinnott
2019 Ms K Slater
2013 Dr A Smith
1989 Mr J Spencer
2016 Mr P and Mrs S Steele
2019 Mr D Stockdale QC
2016 Dr R W and Mrs P Stoddart
2001 Mr R N J Sutton
2018 Dr M Taylor
2000 Ms W Taylor
2012 Mrs C Taylor-Bruce
2000 Mrs N E G Tennant
2017 Professor J Thomas
2009 Professor D G Thompson and Dr H F Thompson
1981 Dr J S Thompson and Mrs H Thompson
2017 Ms M Thompson
2011 Dr J Tipping
2016 Dr J Tomlinson
2016 Mr A Treece
2010 Mrs H M Turner
2010 Dr B J Tyler
2004 Mrs P Verdin
2018 Dr J Wager
2005 Mrs J M Wainwright
2009 Professor T W Warnes
2008 Professor J C Waterton
2018 Dr S Wattam

2014 Mr N P Webb
1964 Professor G Wedell
2014 Dr C Weinkove
2017 Mr I Whelan
1999 Mrs S A Whitaker and Mr P N Whitaker
2015 Mr T Whitehead
2015 Mr C Whittall
2010 Mr B D Williams and Mrs E M Williams
2018 Mr M Williams
2012 Dr P C Williams
2008 Mr P Willson
2017 Dr W and Mrs E Wilson
2008 Mrs B Wingard
2013 Professor D Winterbone
1994 Mr A J Wood*
2009 Mr B Yates
1981 Mr A G D Yeaman
2013 Mr R F H Young and Mrs B Young
2010 Mr L Zastawny

The Manchester Literary and Philosophical Society was founded in 1781 for the advancement of literature and science and the widening of interest in public affairs.

The Main Society meetings are open to the public as guests of the Society, as are the Society's Young People's Lectures.

The Memoirs have been published since 1785. A combined author and subject index up to 1999 is available.

Cover illustration: *The Annunciation* [1489-90] Sandro Botticelli, Uffizi Gallery, Florence.

Taken from Professor Desmond Winterbone's article, 'An Unusual Announcement: *The Annunciation with St Emidius* by Carlo Crivelli'