

# **Life, the Universe and Sutton Knoll**

**Barry Hall**

## **Pre-history**

I have always envied those, who from early childhood, have an unerring sense of life's direction and pursue their chosen vocation with seeming ease and content. Unhappily, this was not to be in my own case as I tasted a variety of 'careers' and environments before a redundancy forced me, obliquely, into horticulture and independence. A chance visit to the local library in 1997 introduced me to Stephen Jay Gould's 'Wonderful Life' and a wonderful shift into another world.

Encouraged, I did 'A' level Geology in a year and discovered the connections, literally, with everything under the sun and beyond the sun. Subsequently, whilst studying S260, Geology, with the Open University I came across a sketch by Joseph Prestwich in the East Anglian volume of British Regional Geology (Chatwin, C.P. 1961) which depicted a fossil beach of Coralline Crag and Red Crag in an exposure called the Bullockyard Pit near Sutton in Suffolk. I wondered at the time how on earth would I be able to get to see that even if still there?

After S260 the world appeared flat, no study, no involvement and I had to keep earning. Purely by chance I had come across a prospectus of residential courses at Madingley Hall run by the University of Cambridge and there, hidden within, were several courses on a geological theme tutored by a Dr. Peter Sheldon, at the time head of Earth Sciences at the Open University. He had once studied with Simon Conway Morris and had himself published ground breaking research on trilobites. All of which linked me back, full sphere as it were, to the Burgess Shale and 'Wonderful Life'. Peter proved to be inspirational and for several years my wife Judith and I attended enthralling courses at Madingley and in deepest Wales.

It was Peter who introduced me to the Open University Geological Society, the OUGS, and I promptly joined the East Anglian branch faithfully chaired by Wendy Hamilton. Here I came to know Andrew Fleming, another OU student and enthusiast for all things geological, through several quite memorable field trips to Dorset, Somerset, Shropshire and Wales. In turn, it was Andrew who asked me to join him at a Suffolk RIGS meeting at Ipswich Museum on the 16<sup>th</sup> November 2002 having apparently just regenerated itself after a lapse of many years. Utterly green, unknown and unknowing, I was unable to make any contribution to the meeting and my diary for that day makes no comment, merely confining itself to recording my attendance. Strangely, for me, I was not in the least perturbed. It was all new experience so I just kept at it, attending all meetings and field trips and slowly, so slowly, becoming more known and more knowing. One other attendee at that meeting, Jeff Redgrave, I would not see again for eight years and what a change of circumstance that proved to be!

Subsequently, I came to know all concerned with Suffolk RIGS very well, especially Bob Markham, our Chairman, Caroline Markham, Hon. Secretary, and Dr. Roger Dixon, our Treasurer. It was a stroke of wisdom from Bob to casually re-brand us as 'GeoSuffolk', a far broader and more consumable title. However, unable to make any academic contribution I struggled to contribute at all other than as stand-up audience on field trips. Suddenly, there then occurred two events that red-shifted that extreme to the other end of the spectrum.

## **Events**

Firstly, Andrew Fleming had drawn our attention to the need for a formal Constitution and, after pointing out some inconsistencies and errors in a provisional draft, it somehow devolved on me to

resolve them. Using the experience gained in a previous life as Captain of a large tennis club, where the constitutional rule book was always in demand, and after plentiful amendments even up to the last minute, this was duly signed by a full house on 7<sup>th</sup> January 2006. Significantly, Objective 3 of the Constitution read: 'To promote the conservation of RIGS and other Geosites in Suffolk', whilst one of the Aims was 'To enhance the educational value of Suffolk Geosites'.

Secondly, I was ineluctably drawn into practical geoconservation at Sutton via an innocent sequence of events. My first field trip with GeoSuffolk had occurred on Sunday 25<sup>th</sup> May 2003 when a visit to Sutton Knoll and Ramsholt brought me face to face, finally, with the Bullockyard Pit where Prestwich had revealed the evidence for fossil beaches. Further round Bob passed me a spade and I scattered some undergrowth to prove the existence of the Coralline Crag below, not then appreciating the significance of this first physical contact. Next, on Saturday 4<sup>th</sup> June, battling through the chest high nettles at Butley, I rashly suggested to Caroline that I had the tools and equipment to make a path and clear an apron in front of the Red Crag exposure. By coincidence this site was familiar to me as I clearly recalled a photograph of this very spot from *The Observers Book of Geology*, given to me as a Christmas present on my 12<sup>th</sup> birthday since, alas and alack, for me they coincide.

The possibility of actually doing some 'conservation' had been discussed at many committee meetings but it was not until October of 2004 that routine site management, of a kind, commenced at Sutton Knoll with the approval of the landowner, Guy Quilter of Sutton Hall Farms. Initially this was in the Chicken Pit, where a 10 x 4 metre rectangle of overgrown Coralline Crag 'cliff' was cleared of vegetation and then regularly maintained, experimentally to begin with. These routines continue to this day. From my work diary for October 10<sup>th</sup> 2004 : *"Arrived Sutton 10 am. Unloaded tools in the Chicken Pit, cut down and treated elderberry and commenced weeding/tidying inside designated area (marked out by my trademark iris blue wooden stakes. 'Good for vampires' said Roger. 'Only blue ones' I replied). Roger and Bob arrived 11.15. They cut into the bank and began looking for fossil shells. Left them to it whilst I first cleared the rest of the bank (with a good clean edge) then used the hedgetrimmer to clear the growth (from an old excavation nearby) down to the London Clay. Raked out and removed all arisings"*. I also mention 'We had a good lunch on the grass and in the sun' thereby revealing part of the magic of these exercises, good company and unique surroundings! This exposure is still subject to ongoing research, see Chapter

It had already seemed to me that the principles, tools and techniques commonly associated with gardening (that glorious mixture of art, science and hard work) were equally applicable to the conservation of these sandy, weed infested and overgrown sites. However, as 'conservation' in this context cannot mean keeping something in a steady state of preservation, I prefer the phrase 'site management' to describe the best possible presentation and maintenance of a geological exposure. For visiting groups to get maximum value and pleasure from their visit there were three necessary components: easy access, good viewing platforms for maximum visible impact and vegetation free exposures, all at any time of the year. Holding a site in this condition against natural re-growth and the ceaseless activities of rabbits, moles, deer, sometimes cattle, had required the invoking of the old horticultural mantra of 'little but often'. This manifested itself in regular fortnightly visits, especially during the growing season, as I inserted Sutton into my regular work programme. On average, a mornings work of routine hand weeding, perhaps some spraying, re-defining boundaries, raking back rabbit spoil, debris clearance, path mowing and repair, kept the Chicken Pit in continuous good order. Weeds, leaves and debris were removed to form an 'ecoheap' where they compost down naturally. A huge natural advantage at Sutton was the sandy nature of the soil where weeds release comparatively easily and paths and viewing areas never become muddy.

## Inflation

In February and September of 2006, research work funded by English Nature, (now Natural England) under their 'Facelift' programme, had exposed a total of four more sites, plus one modified, situated at different points around the Coralline Crag 'island' at Sutton, in particular the re-exposure of the fossil 'beach' last seen by Joseph Prestwich (later Sir Joseph) 150 years earlier. Some of these required new path access but all required the same by now well established procedures as, if unattended, green reversion could occur within as little as a few months. To maintain this number of dispersed exposures working alone could easily take five hours or more at each fortnightly visit so, at this point, I need to thank all those committee members and volunteers who have regularly joined me on a Thursday over the years, hopefully to enjoy the fresh air, the inspiring views, the unique geology, the companionship and the rewarding work. These occasions also became a convenient exchange of news and views, almost intermediate committee meetings, latterly crowned with a convivial lunch either at the Plough in Sutton or on to the Ramsholt Arms.

Another regular topic, frequently discussed, was the need for a Site Information Panel at Sutton. Emboldened by nine years of practical experience in the Point of Sale/Display industry and having recourse to the expertise and talents of my daughter Elizabeth, who happened to work in a similar arena, I put my hand up and volunteered to fund and produce such a panel, hoping thereby to make a contribution and save GeoSuffolk the expenditure. In the event, following a field trip to Sutton, the East Midlands Geological Society (Hamblin, R. 2009) gave a generous donation towards the cost of the panel which was most welcome. Enthusiastically I set to work. Purely as a convenience, I used a three column format simply because Elizabeth could print out one third full size and I could stick three together for an inexpensive full size (870 x 623 mm) proof. We had agreed a basic text and a map and Roger had provided a cross-section of the Coralline Crag 'island' set in Red Crag seas. Although aware of my academic limitations I nevertheless, too enthusiastically, endeavored to include a reference and explanation for most of the features of the site which we had often discussed.

This proposal duly received some constructive criticism although, in my defence, I had always thought that real work on the panel would only start from this point. On Thursday 31<sup>st</sup> January 2008, after being rained off at Sutton, we retired to Woodbridge where Caroline kindly cooked lunch. Tim (Holt-Wilson) arrived, much experienced in the visual presentation of ideas and information, and we sat down to discuss the proof. 'Do we have the basis for a panel?' I enquired, being much relieved to hear that we did. From my diary for that day: *'Tim arrived and afterwards we spent 2 hours or more discussing the Sutton Panel. Everybody had an input and the result was a more refined product – less text, more pictures. A lean, mean panel as Tim put it.'* Nevertheless, this was just the start of many months of alterations and improvements. Elizabeth never lost her cool through at least 25 full draft revisions although, I suspect, there was a subtle difference between true cool and apparent cool.

There was, of course, yet another problem, two in fact. How best to present the panel? Also, since the site was an SSSI and in an Area of Outstanding Natural Beauty, would it get planning permission from the local council? This latter we understood to be most likely but would depend on the actual product. How best then to present it in situ? It had to be something that I could easily manage to construct myself, transport and emplace. I decided on two 8 x 2 vertical timber supports (in trademark blue!) angled back at a suitable height and held securely by a 6 mm aluminium plate to which the panel, stuck to a 15 mm plywood support, could be attached. The bottom end, temporarily held together by battens, would gain strength when concreted into place. The true

benefit of this arrangement was the simplicity with which the panel could be replaced if required (twice as it happened).

From my diary for Thursday August 7<sup>th</sup> 2008: '*Away by 8.30 and arrived Woodbridge and Suffolk Coastal District Council by 9.25 and met up with Bob and Caroline. After making our panel presentations to the Planning Officer and his short absence, the end result was – no planning permission was required. Anti-climax!*' However, we were fortunate, as even a slight increase in size would have brought us into the scope of planning regulations.

From my Diary for Thursday December 11<sup>th</sup> 2008: '*Loaded plinth plus panel and wheelbarrow, ballast (x 3) and tools etc. Drove to B & Q for cement and on to Sutton by 11am. With help from Bob and Caroline I dug out the rectangular hole some 15 “ deep and emplaced the plinth. Concreted in and replaced the turf. Took some photographs for the record. Quite cold so packed up by 1 pm.*' That was it, another anti-climax! The panel was positioned just inside the SSSI boundary fence, alongside the public footpath, and opposite the managed North Pit exposure. Slightly to the right, sloping down almost directly North, was the grassy Red Crag flank of the island which, unknown then, would become GeoSuffolk's first venture into the enhancement of a geological feature.

The panel received its official unveiling on Thursday 14<sup>th</sup> May 2009. Twenty guests, including Dr Jonathan Larwood from Natural England, Dr. and Mrs. Hamblin from the East Midlands Geological Society and Professor Richard West from Cambridge, applauded as Mrs. Jenny Quilter cut the red ribbon and revealed the panel. Brief talks, introductory, explanatory and descriptive, by our Chairman Bob Markham, myself and Dr. Roger Dixon went down well as did the champagne and sandwiches conjured up by Caroline. There followed a guided tour of the knoll taking in the Bullockyard and Chicken Pits and pausing also at a diminutive group of four freshly planted young trees, labelled 'The Pliocene Forest', before heading off for an interesting lunch at Ramsholt to end the day. (Hall, J. 2009)

## **Enhancement**

I cannot remember exactly when it was, but most probably early 2009, that Roger brought to my attention a pollen analysis taken from some 4 million year old Pliocene age deposits at Orford, just a few miles north-east of Sutton. This research, by Professor Richard West, (Andrew, R. and West, R.G. 1977) indicated that forest was regionally dominant in a coastal region on the western margins of the Pliocene sea, a time when the marine Coralline Crag sediments at Sutton were forming, although a variety of other habitats were also indicated such as near shore, dry upland and lowland swamp situations. Such analyses are quite rare from this period but it correlated well with a chance pollen analysis from Sutton itself by Gibbard and Pegler in 1988. (Gibbard, P. L. and Pegler, S. M. 1988) Together they show a complex flora with a substantial representation of present day plants with an Eastern Asian and North American affinity such as Japanese Umbrella Pine, *Sciadopitys verticillata*, and Western Hemlock, *Tsuga heterophylla*. This revealed flora is very important as it provides the main evidence for the immediate pre-Pleistocene flora in Britain before subsequent local extinctions caused by the onset of glacial conditions.

I had previously suggested an amenity planting of similar trees for a site development plan at nearby Waldringfield Heath (Markham, C.J.K. 2008) but nothing of a practical nature had ensued. However, Sutton itself was a different proposition as it was continually managed and monitored by

GeoSuffolk already and we discussed enthusiastically the possibilities of a modern replication of the Pliocene flora. I had earmarked an ancient, partially fenced, 8 x 4 mtr animal pen on the northern flank of the knoll as a suitable site for such a project as it was easily visible from the position of the Site Information Panel. We were given permission to use this site and to erect a 2 metre high protective deer fence by the landowner in the spring of 2009. A minor miracle was the discovery of an old water trough nearby, hidden by nettle and elder, which was still connected. This was to prove crucial to later developments. Funding for the fencing and the trees was given by the Curry Fund of the Geologists' Association and work was progressed by GeoSuffolk members. In addition to an Umbrella Pine and a Western Hemlock, a groundcover form of Eastern Hemlock, *Tsuga canadensis*, a Sweet Gum, *Liquidambar styraciflua* and two grasses, *Stipa tenuissima* and *Stipa gigantea*, were planted. It was this miniature embryonic 'Pliocene Forest' which had aroused interest at the panel unveiling on the 14<sup>th</sup> May.

### Expansion

At a committee meeting on the 5<sup>th</sup> September 2009, I suggested creating a much larger enclosure to accommodate a greater variety of the 'Pliocene' genera known from the pollen record and to think of the project in the longer term, say five to ten years or more. This suggestion met with approval and I was requested to mark out the proposal and obtain quotes for the deer and rabbit fencing. On September 10<sup>th</sup> I tentatively staked out a new enclosure on the North flank, centred around the original, seeking as large an increase as I dared without risking a refusal. This gave a perimeter of 130 metres enclosing a new area of some 800 – 900 square metres (although I realised later I should have dog-legged the two sides running downhill). We were much relieved to get approval for this from Guy Quilter, who then had to approach Natural England for theirs as we were on SSSI territory. A letter was drafted which concluded: “ *A database of name, source, size, location and date of planting plus other relevant details will be established. On site rainfall will also be recorded. Both myself and GeoSuffolk feel this project brings Geology and Palaeobotany together in a practical manner and will add sympathetic scientific and educational value for visiting groups whilst giving explicit aesthetic value and general interest to an already outstanding and well managed site*”. Quite so!

I then sought out local contractors to give estimates for the fencing. One of these was Jeff Redgrave who I discovered was in that line of business. Since Jeff was known to us, was also a geologist, and his quote was by far the most competitive, it was decided to give him the work and to again seek funding from the GA Curry Fund. This application was left in the capable hands of Roger who eventually sent an exultant text on Friday 12<sup>th</sup> March 2010: '*We have funding!*' Unable to make verbal contact I left various confirmation messages for Jeff with a request for a start date as I was desperate to commence planting my stockpile of trees. This was not certain until, finally, on the morning of April 28<sup>th</sup> I received an early phone call from Sutton – work had commenced!

From early February some pre-planting preparation had been taking place alongside the usual ongoing site management. Using my traditional blue stakes the whole site had been divided up into 13 discrete sections with a location reference inscribed on a sunken concrete block centred in each. Uneasy about the approaching date of 22<sup>nd</sup> May, which had been set for a GA field trip to Sutton and combined with a 'Pliocene Forest' opening ceremony, (Dixon, R.G. 2011) plus also the lateness of the season, I felt planting had to begin. Between the 1<sup>st</sup> April, with the planting of a standard size 'Dawn Redwood', *Metasequoia glyptostroboides*, and the 20<sup>th</sup> May, sixteen substantial specimens had gone into the ground. As we could only be fairly sure of a few trees at species level from the pollen record (most are generic and one, cypress, at family level) it was decided to add scientific, conservation and educational value by sourcing trees with high added interest where possible e.g.

the *Metasequoia* was only known from the fossil record prior to 1947 when living trees were found in China. The free draining sandy soil was modified with organic compost, weathered bonfire ash, soil based fertiliser, bone meal, and carefully mulched after watering in. A complimentary fungal Rootgrow treatment and Water Retentive Granules were added as a safeguard. Most of these plants had to be secured from predators by temporary fencing.

On Thursday 29<sup>th</sup> April, after an interval of eight years, I met Jeff Redgrave for the second time. We got on well and the fencing, excellent, seemed to progress smoothly. I can still feel my sense of relief. That day we planted Rosemary and Roger's *Ostrya carpinifolia* and a *Picea breweriana* to commemorate Caroline's mother. The 22<sup>nd</sup> May, myself and Judith's bright and sunny 25<sup>th</sup> wedding anniversary, came and went. The ribbon was officially cut and David Bone eloquently extolled the virtues of the Curry Fund and introduced a substantial Pliocene Forest to the world. After a tour of the fresh and pristine exposures we made our apologies and left for a holiday in Scotland.

### **Hitherto and Thereafter**

Previously, at the Geologists' Association Festival of Geology at the University College of London on Saturday October 31<sup>st</sup> 2009, GeoSuffolk had presented a 3 ft specimen of Japanese Umbrella Pine for raffle. Although we raised £100 towards the cost of plants for the 'Forest', it did highlight a need for plant funding as some proved to be quite expensive. At a committee meeting on November 28<sup>th</sup> I suggested sponsorship as a means of recouping outlay, with sponsors names added to the database and the specific plant label. This was agreed and from then on we pursued this actively with one outstanding and quite unexpected consequence.

Judith and I had been invited to the 40<sup>th</sup> wedding anniversary of Bryan and Stella Carter, for whom I had worked for many years, becoming in the process almost a member of the family. Over breakfast, before taking our leave, I explained GeoSuffolk's Forest project and suggested to them, with a big smile, that they might like to sponsor a tree to mark their anniversary, which they kindly agreed to. Meeting up again a few days later, to my complete surprise, they added that they would also like to make a donation towards the project. In the event this proved to be a substantial sum and, for the first time, we felt the 'Pliocene Forest' to be reasonably secure. On the 22<sup>nd</sup> September 2011 Bob was finally able to show Bryan and Stella around the Knoll and for them to meet their sponsored tree, *Betula nigra* 'Wakehurst' and the Forest itself. Afterwards we all gathered at the Plough for a convivial and rewarding lunch.

Nevertheless, the effort to achieve sponsorship did not falter with a collective £175 being raised by GeoSuffolk at the annual GA Festival on 6<sup>th</sup> November 2010. Further progress has been slow but steady and the minutes of a GeoSuffolk committee meeting on the 27<sup>th</sup> August 2011 record the acquisition of 100 trees at a cost of £1,858. Of this, £1,448 has been received in sponsorship.

**A 'Pliocene Forest' Panel.** The more we progressed with the forest the more we came to realise that an on-site explanatory panel was required to compliment the existing Site Information Panel. Feeling a little more on home territory (and vastly more experienced now!) I began to put together a few ideas around Christmas 2010 and liased again with Elizabeth. The usual permissions were sought and this work continued during the spring of 2011 in tandem with further developments at Sutton. As planting proceeded I began to feel the restriction of the two long downhill sides and proposed giving ourselves some desirable width with an extra 12 x 5 metre enclosure on each flank with another 4 x 3 metre enclosure against the SSSI perimeter fence at the bottom, this to

specifically contain a native Black Poplar, *Populus nigra* subspecies *betulifolia*, as part of Suffolk Coastal District Council's conservation programme. I staked these out and obtained approval from Guy Quilter and the gamekeeper, Peter Hinds. On March 3<sup>rd</sup> Monica O'Donnell from Natural England paid a first visit to Sutton and added her official approval. Jeff Redgrave was called on again to quote for the additional fencing which, on this occasion, we would be paying for ourselves. When this was received it was decided to save money by constructing the lower enclosure ourselves using materials salvaged from the original pen, a task Roger and Rosemary took upon themselves with great determination.

Meanwhile, before the fencing could proceed, I needed to create a 'wetland' habitat in the north-easterly enclosure. I found a man, Geoff, with a battered Kubota digger still proud enough to tackle the soft Suffolk sands. On March 31<sup>st</sup> 2011 we excavated four square metres to a depth of one metre which we then lined before replacing the sand, carefully, around an inspection pipe (for water depth). When filled with water I was most pleased to find this worked perfectly, solid to walk on but always just moist as the water wicked up and evaporated. This would prove a Des. Res. for willow, *Salix magnifica*, three bog myrtle, *Myrica gale*, a swamp cypress, *Taxodium distichum* and several ferns and grasses. On April 14 Jeff arrived and the enclosures soon constructed.

All these changes meant last minute alterations to my database, location map and embryonic panel. However, I eventually submitted my suggestions, in the form of a large scale proof as before, to Bob, Roger and Caroline for consideration. Whilst retaining the three column format I had switched to more vegetative colouring in keeping with the subject and crossed my fingers. Mostly fine, but we agreed to delete the pollen diagram along the base in exchange for nine individual photographs of trees and where they could be found on site. This provided greater interest and improved the general appearance of the product. Many minor tweaks followed but the panel was defined. Location was problematic but we eventually agreed a position slightly right of the SSSI entrance gate, directly to your front as you approach the knoll. It had a first public viewing on Thursday 28<sup>th</sup> July by the Geological Society of Norfolk, on a field trip to Sutton, just moments after Caroline had helped me screw it to the backplate.

## Finale

I sincerely hope Charles Lyell, Searles Wood Snr. and Jnr., Joseph Prestwich and other eminent geologists from Victorian times to the present day who have been associated with Sutton Knoll, would and will approve of GeoSuffolk's management, which is periodically reviewed by all concerned. I am sure Joseph would approve of the 'Pliocene Forest' as he was keen to introduce *Ginkgo biloba* (not permissible at Sutton) to his Kent garden, although not too successfully. (Prestwich, C.A.M.M. and Geikie, A. 1899) For myself, I was extremely proud, along with Judith, to represent GeoSuffolk at the Geologists' Association Conference on Geoconservation for Science and Society on September 9<sup>th</sup> 2011 at Worcester University. My dynamic has always been at the sharp end of geoconservation, so it was particularly relevant to have a world-wide overview of Geoconservation and to discuss with fellow conservators their own projects and problems.

My grand-daughter Ailsa, just eleven and a tree sponsor at Sutton herself, had to conduct and write up an interview for homework. She chose to question me with regard to the 'Pliocene Forest'. Her last question was: "What will happen to the site in the future?" Off the cuff I answered "The site is a protected Site of Special Scientific Interest, so for the time being it is managed although the future is indefinite as some of the trees can live up to three thousand years of age."

In any case, I hope they grow on long after my particles have lost their charge.

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