

British Section

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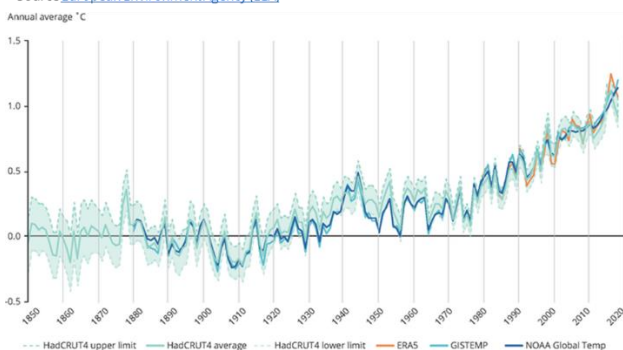
**“Thought for Food” by
Dr Christian Reynolds
On-line Lecture 1st March**

Provides plenty of Food for Thought!

Dr Reynolds, Senior Lecturer at the Centre for Food Policy, treated us to a whistle-stop look into the science behind all possible aspects of food, from its production to the dinner table and beyond. The lecture started with the big challenges related to food. The first is the link that exists, and has always existed, between food and the climate. These can be from the annual changes in the climate impacting crop yields due to seasonal drought or unexpected frosts damaging crops and grape vines through to progressive climate changes dictating what crops would grow in specific areas, causing falling crop yields and in the past forcing the inhabitants of these areas to change their diet.

Global average near surface temperature since the pre-industrial period

Source [European Environment Agency \(EEA\)](http://European Environment Agency (EEA))

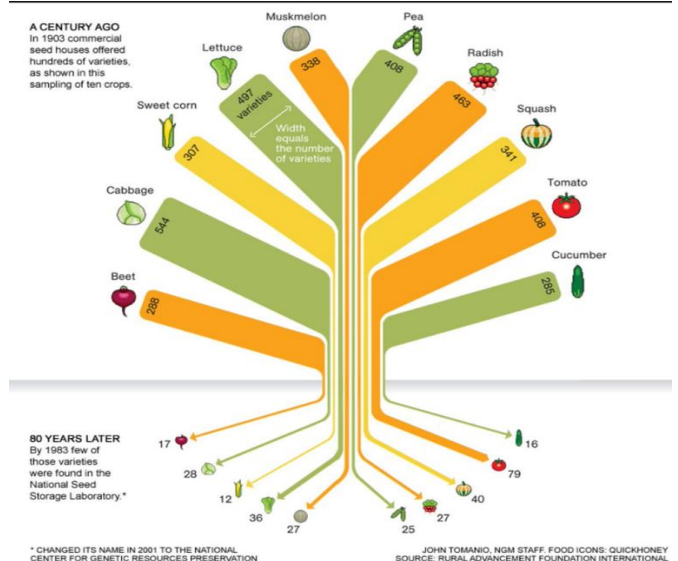


The 1500-1700s, with a cooling change of probably no more than 0.5°C, saw changes in modes of food production, changes in commodity prices and changes in consumption and diet that are the

foundation of our modern food system. Today however, we are dealing with a warming of perhaps 1.1°C.

Secondly, we face a production challenge that requires an increase in crop production from the same areas of agriculture land and a reduction in consumption.

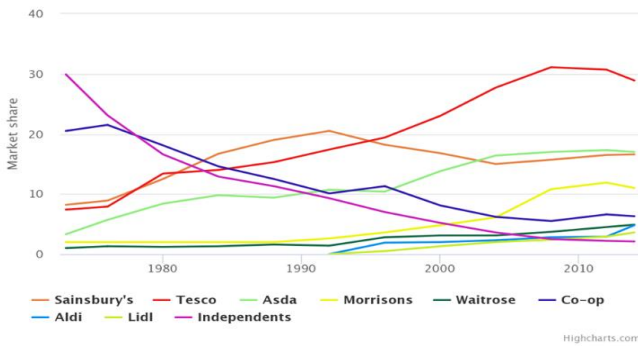
The third challenge is biodiversity for both animals and plants. The number of species of mammals is threatened through loss of habitat caused by agriculture, logging and urban development. A century ago the number of varieties of a selection of ten vegetables numbered an average each of 388 - eighty years later the average for the same ten vegetables is 31.



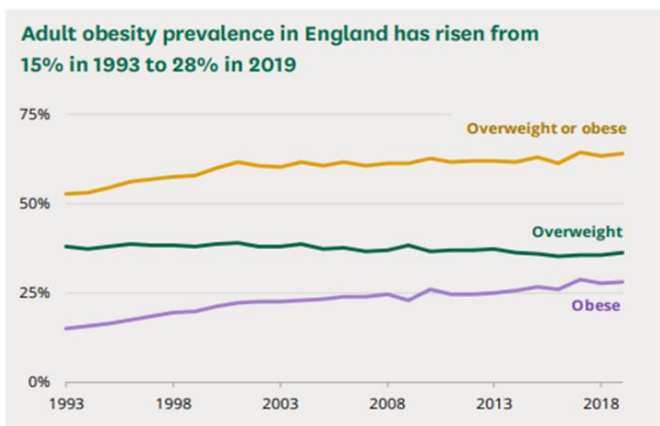
The fourth challenge is urban development, projected to increase from 54.5% in 2016 to 66% by 2050, and the difficulties of securing supplies and overcoming supply chain complexities of local produce to the increasing population. Currently the UK is

importing 50% of its food and feed with the associated greenhouse gas emission impacts being located abroad. 50% of urban areas are greenspace - could this be used for food? How and where we purchase our food is continuously changing and local food is an integral part of the system.

UK grocery industry in the last 40 years

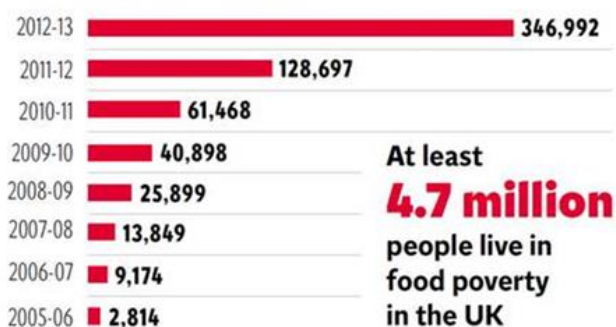


The second part of the lecture took a look at what we eat and how changing our diet can help the challenges of the food chain and our health. Due to the food we eat, as well as lifestyle and activity levels, our waistlines are changing.



5% of NHS spending and \$2 trillion globally is spent on treating obesity related illnesses.

NUMBER OF PEOPLE GIVEN EMERGENCY FOOD FROM TRUSSELL TRUST FOODBANKS



Food poverty and insecurity is increasing with estimates of up to 9million people in the UK too poor to eat properly.

Food is responsible for 26% of global greenhouse gas emissions and 23% of these emissions is waste and loss of food that is never eaten. If food waste and loss were a country, it would be the third largest greenhouse gas emitter. The two biggest reductions we can make are: reduce food waste and loss and shift to sustainable diets. Shifting to sustainable diets can help address the global challenges:

- A. Reverse biodiversity,
- B. Live within the global carbon budget for food,
- C. Feeding humanity on existing cropland,
- D. Achieving net positive emissions, and
- E. Optimizing crop yields for resilient landscapes and communities.

Currently we do not eat the recommended dietary patterns.



Eating the recommended diets reduces emissions: **GOOD FOR YOU IS GOOD FOR THE PLANET TOO.** Increase fruit to 100-300g/day, vegetables to 200-600g/day and reduce consumption of animal products. To improve all nations, move towards the recommended diet. More consideration is required of local produce and traditional diets with advice on the implementation of 'global healthy sustainable diets', including discussion on recipes and how we cook with real-life examples. We have only just started to see the translation into sustainable gastronomy.

Disrupting eating (and cooking) for lower carbon emissions

Current guidelines focus on

- 1) Reducing consumption instances
- 2) Smaller portion sizes

0-28g per day for beef, lamb or pork

1) Typical beef portion in the UK: 70-80g, once weekly



(Cooking in small batches inefficient)

2) Integrate 28g of beef into other dishes



(Cooking in fast/sustainable, Batch cooking)

3) Adapt UPFs trends to be lower emissions. E.g. blend with sustainable protein.



(Encourage reheat?; Batch cooking, leftover (re)use)

There are many paths to sustainable diets and younger generations do show a reduction in greenhouse gas emissions compared to the older generations, with the largest reductions over time showing up in ruminant meat. However, the increase in consumption of ultra-processed foods from the 1950s by the younger generations is becoming a problem in health terms.

We need to continue engaging with existing trends and to identify and implement, from now on, practical coherent solutions. A quote from Science (November 2020) "Global food system emissions could preclude achieving the 1.5°C and 2.0°C climate change targets".

The lecture concluded with three ideas:

1. Reduce animal products and increase fruit and veg; a 30% reduction in dietary greenhouse gases from eating 5 a day and following the Eatwell Guide (Veg can be canned or frozen).
2. Check your energy supplier. Move to companies providing genuine sustainable energy supplies (This is a difficult one at this moment due to the world upheaval in energy supply prices).
3. Check your fridge temperature. To keep your food fresh longer and help prevent food-borne illnesses, the ideal recommended temperature for your refrigerator is 4°C (Freezer -18°C).

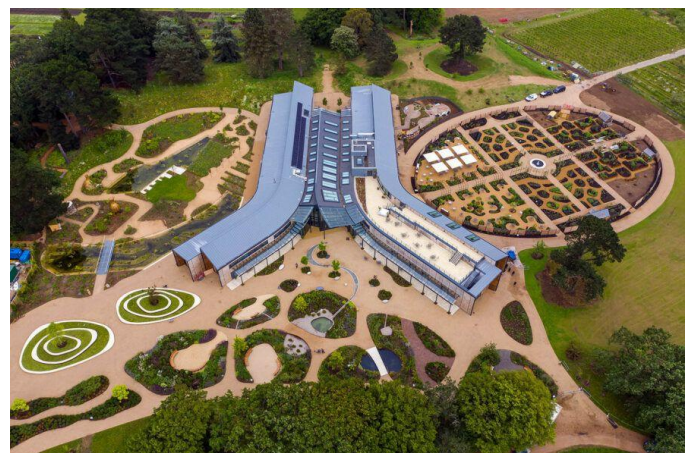
There were some fifteen questions asked at the end of the lecture by the members.

Allotment gardening was supported as an excellent way to produce local produce. 'Best before date' are considered too conservative and discussions are being held to abandon them where there is not a health risk. For most foods bearing this date, the food is perfectly all right to eat after the date and it is easy to decide visually whether to eat the food e.g. green to black bananas and mould on cheese that can be scraped off. This date is quite different to the 'Use by date', which requires the food to be properly stored and is there to prevent food related illness. Fish is an excellent food in diets but there are controversies around fish farming, the sustainability of stocks and line catching. In the UK we throw away 7million tonnes of food but a new device which indicates the freshness of food in real time has been invented and is due to be put into use by the food industry.

Ron Walker

Visit to the Hilltop Laboratory at RHS Wisley ~ 16 March '22

On the only wet day of the week, a couple of dozen IESF members and partners undertook a tour of RHS's new Home of Gardening Science, Hilltop, at Wisley in Surrey.



An Aerial view of Hilltop with the circular World Food Garden

Hilltop brings together all of Wisley's scientists under one roof and has taken 8 - 9 years from concept to fruition. Previously, the scientists were based in various locations around the Gardens. One location was the existing building at the old entrance to the Gardens, which was not a house but a science laboratory built after WW1 using material from two demolished buildings. Hence, its appearance like an Edwardian manor house.



RHS Wisley's Original Laboratory

Hilltop has been designed as a 'smart' building incorporating solar panels as well as rainwater collection. In addition, it has below ground a large water storage capacity, which is used to regulate the building's temperature; heating in the winter, cooling in the summer.

The ground floor of the building houses one of the RHS's two main libraries. The other being in their Head Office in London. The library is open to members who are able to borrow books as well as having access to rare gardening books. In addition, many of their gardening books can be downloaded as ebooks.

RHS Wisley has always encouraged visit by primary school children. One of Hilltop's aims is to provide elements of the GCSE curriculum for secondary school children, covering the environment and climate change in addition to encouraging children of all ages to develop a love of gardening.



RHS Hilltop Laboratory entrance

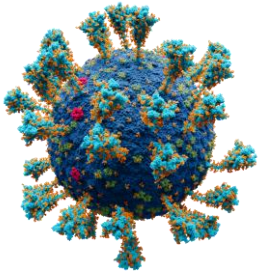
The Horticulture and Environmental Laboratory brings together specialist scientists for all elements of gardening. Recently, the laboratory has added water scientists to look at the effects of climate change on UK gardens and, amongst other things, how to increase water saving and storage. The laboratory endeavours to identify and preserve both flowers and vegetables, including all iterations of plants as they change with each new hybrid variety. Their collection of pressed cultivars is one of the largest in the country and included a potato plant complete with its flower collected by Charles Darwin.

One of the Laboratory's scientists is an expert on slugs and our tour guide advised us that there were 43 varieties of slugs in the UK and only 9 are regarded as pests whilst the other 34 had a positive impact on our gardens. It can be said that he did not get much enthusiasm to this statement from the gardeners in our group!

Adjacent to Hilltop is the new World Food Garden where the RHS team grow a variety of vegetables, old favourites as well as new varieties from Africa and Asia, that have been introduced into the UK by generations of Commonwealth men and women. RHS believes that as the UK warms due to climate change, these new varieties will need to be developed to take account of the higher temperature as well as their potential to be grow with reduced water.

President's Inaugural Lecture 28th March '22

After John Beck had introduced IESF to the non-member visitors, our outgoing President, David Hughes gave a rundown on his two eventful Covid years including a slide of the Covid-19 virus. He thanked John Beck for his sterling service to IESF as Hon Sec for the last 22 years and then handed over the IESF Presidential jewel to our new President, Norman Train.



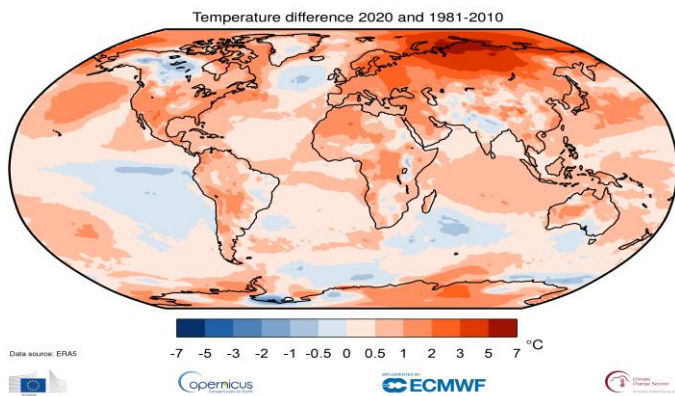
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Norman's Presidential Lecture was entitled 'Climate Literacy'

The lecture's aim was to give an overview of the desire to achieve carbon net-zero by 2050 together with the phasing out of the fossil fuels; coal, oil and gas.



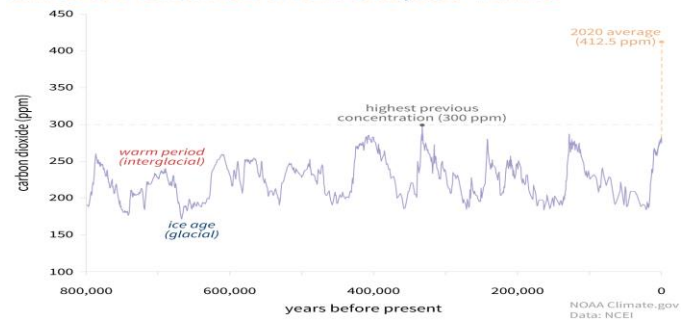
The average global temperature rise since the 19th century is 1.1 deg C. This however, is too simplistic; heating of part of the northern

hemisphere landmass has risen by up to 7 deg C which has been off-set by the heat sink of the southern hemisphere oceans.

Climate can also be seen in terms of radiant heat across space. The sun radiates heat to the earth where the atmosphere and the clouds protect the surface of the earth from extreme temperatures. The atmosphere is made up of greenhouse gases - without them, the surface temperature would be minus 18 deg C. The changing amount of greenhouse gases due to burning fossil fuels is causing the global temperature rise. Affect the atmosphere and the earth's surface temperature will be altered!

Over 800,000 years, the carbon dioxide (ppm) in the atmosphere has fluctuated between 180 and 280 ppm. Over the last 200 years, the use of coal and latterly oil has raised the carbon dioxide level in the atmosphere to 420 ppm, a 50% increase and it is still rising!

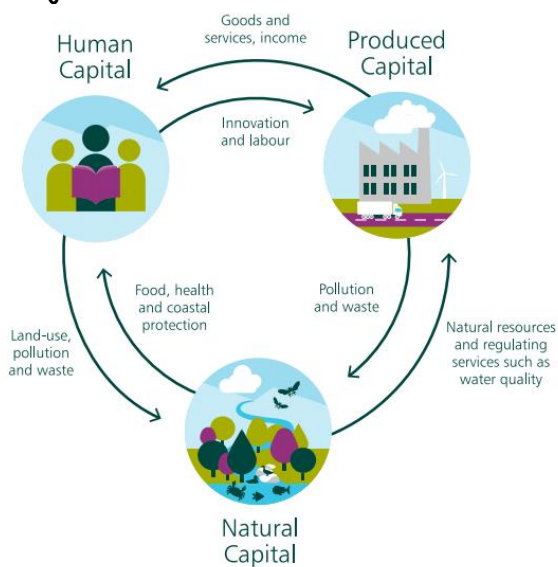
CARBON DIOXIDE OVER 800,000 YEARS



In the early part of this century the UK aimed to reduce its carbon emissions from 600Mt to 500Mt by 2022. This was achieved primarily by the reduction in coal use and the increase in renewables and biomass. Some activities such as international air travel and shipping were excluded from the overall calculation. The next aim is to reduce the amount to zero by 2050. However, the tonnage figures that are used to calculate the UK emissions excluded the emissions produced by imported goods such as foreign

cars, steel etc. This has been estimated to represent 270Mt. It was agreed at COP26 that these should be reported in the manufacturing countries' emissions on an annual basis.

Economists have shown that there is a strong correlation between GDP and emissions. Unfortunately, GDP only measures economic growth. Biodiversity and sustainability are absent. The Dasgupta Review 2021 states that "GDP is no longer fit-for-purpose and should be junked".



Balance sheets should include the concept of Natural Capital as well as the traditional economic models of produced and human wealth/capital. Dasgupta introduces Nature into the model and showed that we need 1.6 earths to satisfy current demand. New metrics should be added to define biosphere regeneration on the supply side and human requirements on the demand side.

To achieve sustainability we need to increase the pro-active levels, starting at:-

- Level 0. Not letting emissions get worse
- Level 1. Technological reduction in emissions
- Level 2. Total emissions and associated costs /tariffs
- Level 3. New metrics to include environmental and biodiversity

Engineers and scientists might help develop Level 1 but to achieve Level 2 needs political will, with Level 3 requiring visionary thinking. To maintain our current standard of living our energy requirement needs to be based on electrical generation. In 2020 41% of this was dependent on fossil fuels, of which gas was the largest sector at 36% and has grown since. Electricity demand in 2050 needs to be 2.5 x 2020 value. Dispensing with gas will need 4 x increase in the remaining sectors.

The remaining 59% in 2020 came from nuclear, hydro, wind/solar and biomass. New hydro is not realistic and it is debatable whether biomass is green or even a secure source. Electricity produced by nuclear peaked in the 1990s and all the existing plants are due to close by 2030. Currently only Hinkley Point C is under construction, with Sizewell C and Bradwell B still awaiting approval. Even if all three are built, their capacity will only be two-thirds of the 1990s peak. Tim Stone, Chairman Nuclear Industries Association has said "Government policy toward nuclear has been utterly ossified... We've lost the past decade to utter dithering."

Wind and solar have increased substantially but are both subject to the elements.

To counter the use of fossil fuels, carbon capture and storage has to be developed. Whilst trees do it for free, the current target of engineered carbon removal by 2030 is only 1% of the 2020 total. The viability of large-scale storage schemes are yet to be proven.

Decarbonising of the built environment is also required by means of retrofitting domestic insulation and heat pumps - 86% of UK households have a gas boiler - refurbishment rather than demolition,

Norman commented that if we assume that we are at the end of the first term of an

academic year, the report on the UK's progress is as follows:

- Wind and Solar** - Steady progress - **B**
- Coal** - One of the few successes - **A**
- Other Fossil Fuels** - Dependency is a concern; may need go into rehabilitation - **D**
- Biomass** - Too quick; may not last - **D**
- Building Insulation** - A dismal failure - **E**
- Electricity Production** - UK is having difficulty in understanding the basics - **C**
- Transportation** - Hoping for better things in Term 2 - **C**
- Carbon Capture** - Much talk; but no application - **E**
- Ecology Studies** - UK is having difficulty with the concept - **D**
- Community Work** - UK is to be congratulated on working with others at COP26 - **B**
- Hydrogen** - Needs to develop a more critical understanding - **D**

Overall, the UK's score is no better than **C minus**.

The UK public need to better understand and participate in the transition to Net Zero by being aware of their personal carbon footprint as well as the ramifications of procrastination. Norman believes that action is required by all of us.

Lester Sonden, IESF Vice-President, gave the vote of thanks with strict instructions from Norman to keep it short and to accept no questions from the floor!

After the dinner, the vote of thanks from the guests was delivered by Helena, Norman's daughter. She gave us an insight into our President's passion to achieve the net-zero target together with minimising waste in all forms including from the dinner plate!

Visit to the Verulamium Museum & Roman Theatre, St Albans

On a sunny April day, members of IESF and friends gathered in the picturesque town of St Albans to visit the site of the Roman remains of Verulamium. This settlement was the third largest town in Roman Britain after London and Colchester.

From its Iron Age beginnings when it was known as Verlamion, the settlement expanded over 400 years of Roman rule, despite two devastating fires, to become a wealthy provincial town of the Roman Empire with its Basilica and Forum, shops, public baths, temples and Theatre.



Artist's reconstruction of the Roman Forum

Antiquarian exploration of the site of Verulamium first took place in 1847 when the Theatre was excavated. In 1923, most of the site was scheduled as an Ancient Monument, the first in the country. In 1929, St Albans City Council acquired a large part of the site with the intention of laying it out as a public park. Part of the agreement allowed the land to be excavated for objects of antiquarian interest, including setting aside part of the land for the preservation of its ancient monuments. In the 1930s, Sir Mortimer Wheeler and his wife, Tessa, set about the excavation of Verulamium. The current Museum was opened in 1939 to display the full range of the Wheelers' labour.



The 'Sea God' Mosaic

Amongst the many items in the Museum, there are some of the finest Roman mosaics in the country as well as a collection of gold coins discovered north of Verulamium close to the route of the road to Colchester. These coins came from across the Roman Empire as well as some minted in Verulamium.

Just a short walk from the Museum is the Roman Theatre, the only visible example of its kind in Britain. It was linked to two temples dedicated to Romano-British gods and was believed to be used primarily at times of religious festivals but also for armed combat and wild beast shows.



To end the gathering there was a cream tea at the 'Inn on the Park' in the Verulamium Park.

New Members since Dec 2021

Rodney McClelland is retired but previously Project Manager at Alfred McAlpine.

Peter Terrell is currently Chairman of the Board of Trustees of the Institution of Structural Engineers and President of the Terrell Group.

Emma Johnson is currently Senior Regulatory Affairs Specialist, Smart Metering at British Gas.

Brian Back is currently Managing Director and Founder of Radio Data Networks Limited, Environmental Innovations Limited, Euro Technology Services Limited, Field Ventilator Limited and Zero Pollution Network Limited.

John Crosfield is retired but previously Head of Technical Assurance at Crossrail Ltd.

Adrian Brown is currently Senior Safety Engineer at Capgemini UK Ltd.

Professor Michael Wood is currently Consultant and Industrial Professor Emeritus at Aston University, Birmingham.

Ashraff Cader is currently Lead and Head of Engineering - Civil Infrastructure - Piccadilly Line Upgrade with Transport for London.

RIP

Christopher Mitchell Christopher was a Fellow of IET, Member of CIBSE and Senior Member of IEEE, and before retirement a Senior Partner at Kennedy & Donkin. IESF member since 1978 and IESF Past president 1988.

Jenny Curtis was one of our Amis and widow of David Curtis who died in 2019.

Our thanks are due to those who have contributed to this newsletter. The editor welcomes contributions on matters that relate to the objectives of the Société.
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