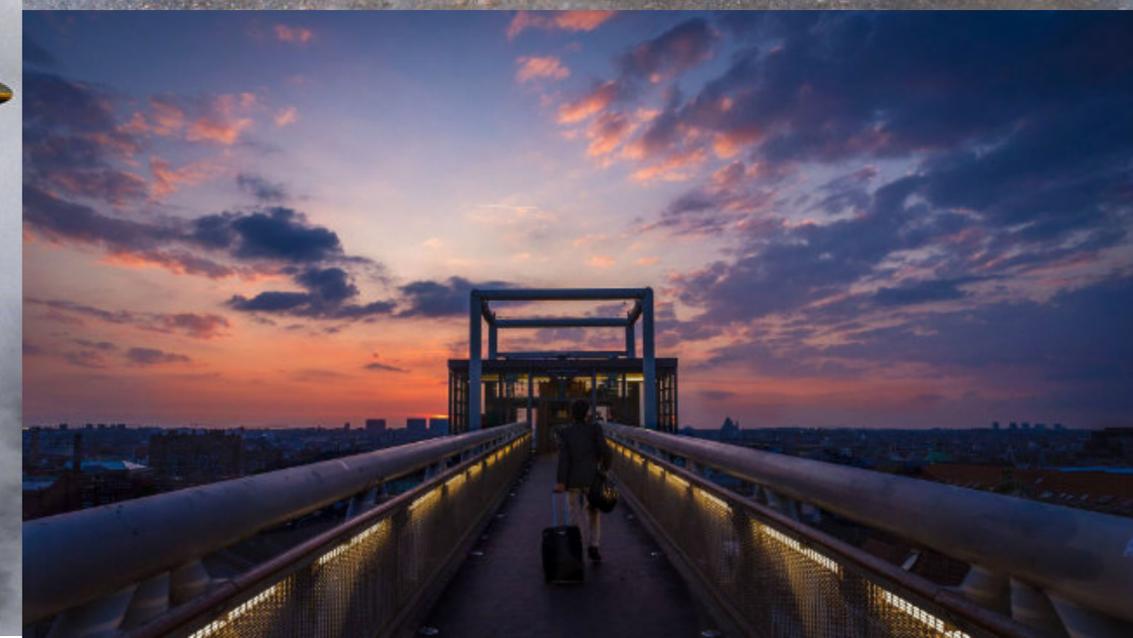


THE WHITTLE



WYCLIFFE LUTTERWORTH u3a
ENGINEERING, SCIENCE AND TECHNOLOGY GROUP



APRIL 2021

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and
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THE WHITTLE

The Monthly Newsletter of the Wycliffe Lutterworth U3A Engineering, Science and Technology Group

MEETING REPORT

April Meeting Zoom Event - The 1948 Berlin Airlift and Interview with Ron Poulton

MEMBERS MISCELLANY

Science History - Expansion of the Universe - Nigel Bedford

MG Cars 1924 to 1939 - Geoff Dean

CORNER NINETEEN

Member submissions for the 'Cycle Assist' design assignment.

This Months Cover - Main Picture - The Gloster Whittle E28/39

To introduce **Nigel Bedford's** science history article the top picture is from the Hubble space telescope. Hubble pictures are in Black and White but are processed to assign colours to gases etc. While this produces attractive pictures the real benefit is that colour helps researchers to establish what gases are within the nebula's being examined. Click on [Hubble](#) for an amazing video on how they colourise the B&W images.

Not all cars in the interwar years were black. The middle picture is a 1936 MG TA Airline Coupe in a striking yellow and black livery. Read **Geoff Dean's** article about the history of pre-war MG Cars. This is the first article in a series on famous British Marques that **Geoff** will be contributing to future issues of the Whittle.

The bottom picture is a public lift at the Place Poelaert in Brussels. **Bob Rigby** suggests this is a possible design solution to assisting cyclists ascending steep inclines. A few other solutions have been offered by our members. The Poelaert lift has been designed for use by pedestrians and cyclists and together with the Trampe lift in Trondheim are a couple of working examples of cyclist assist schemes.

MEETING REPORT



April Meeting

The 1948 Berlin Airlift and Interview with Ron Poulton

April's meeting was a first for the ESTG group as it included a one to one interview with Ron Poulton, an ESTG member. Chris Ridley invited Ron to give his personal account of his National Service in 1949. Ron served in the RAF Regiment, stationed at RAF Gatow which was within the British sector in Berlin.

Ron witnessed the latter part of the Airlift and gave us an idea of conditions in a divided Germany just 3 years after the devastation of World War II.

Prior to the interview we watched an ESTG produced video presentation outlining the events that led up to the blockading of the land access to Berlin by the Russians. We then looked at the operation of the Western Allies to airlift supplies to West Berlin. The success of the airlift eventually led to the Russians to lift the blockade in 1949.

April Meeting Zoom Event - The 1948 Berlin Airlift and Interview with Ron Poulton

This month's two-part Zoom event was well received with some 26 attendees viewing online. From an original suggestion by Andy Hetherington, the resulting presentations were the culmination of effort from both Michael Bates in researching archive material / content and Mike Chapman who "Zoom proofed" the presentation / interview together for the group. The meeting featured an interview with ESTG member Ron Poulton (Ron's son was also able to join us on Zoom) who served in the RAF Regiment around the time of the Airlift. Ron was stationed in Berlin on the ex -Luftwaffe air base at Gatow and I explored Ron's time there with a Q&A session recorded with Ron specially for our meeting.

It is worth remembering that when Ron was serving in Berlin it was 100 miles within the Russian occupied zone, and the Russians were able to control access from western Germany, occupied by the western allies. Also, it was only about 3 years after the end of WW II and Germany was only just starting to recover, with the help of the western allies, from the devastation of the war.

In part one of our meeting, we revealed the situation existing in Berlin in 1948 through a montage of photos, maps, statistics, and unique B&W film shot at the time. This emphasised the urgent requirement for essential supplies and demonstrated the acute need to help the humanitarian crisis of the west Berliners, then under siege by the Russians. Russia had imposed the blockade in protest at the introduction of the new 'Deutsche Mark' as part of the European Recovery Program (ERP), a proposal for economic restructuring of Germany proposed by the western allies. Russia intended to force the western allies to withdraw the 'Deutsche Mark' in preference to the hyper-inflated 'Reichsmark', a currency used throughout the Russian occupied zones.

The western allies, principally America, refused to withdraw the ERP and this created a stand-off between the Russians and the western allies. Supplies in West Berlin would very soon have become depleted, and President Truman in April 1948 authorised the airlift, fearing any land-based action would trigger a war with Russia. The airlift would last until Sept 1949 providing urgently needed supplies including, all kinds of basic food stuffs, fuel, Coal, Medicine, and clothing.

During this time, some 400,000 tons of supplies were delivered by the RAF involving 700 aircraft making nearly 300,000 flights to sustain over 2 million West Berliners. At the time there was no mechanical handling so everything had to be loaded and unloaded by hand.

An unusual aspect of the airlift was the involvement of RAF Coastal Command's Sunderland flying boats flying from the Elbe in Hamburg to Havel Lake in West Berlin. We saw an excerpt from a public information film showing Short Sunderland Flying boats delivering supplies like 'salt', a commodity which would have caused potential corrosion problems with 'normal' aeroplanes but the 'Sunderland's' were specially protected from saltwater corrosion.

Due to the success of the airlift the Russians lifted their land blockade in May 1949.

Continued on next page with description of part two, the interview with Ron Poulton.

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April Meeting Zoom Event - The 1948 Berlin Airlift and Interview with Ron Poulton (continued)

The **second part** of the meeting featured Ron Poulton who, as an 18-year-old conscript was sent, after basic training in Catterick, to Germany to serve at RAF Gatow in Berlin.

We recorded our conversation with Ron which took the form of a Q&A session over Zoom. Ron related his experiences of both the journey by sea to Holland, where everyone aboard was seasick except himself as he spent most of the trip on deck and in the galley!!

Ron's recollection of his posting to Gatow, was informative and amusing and Ron gave a good insight into the running of the base where he was detailed to help guard the supplies as they arrived by plane. However, when on duty he had his service Lee Enfield .303 but without ammunition just in case this sparked off an incident!



Apart from guarding the base, and attending official parades, Ron also drove all sorts of vehicles in Germany including "3 tonner" trucks. Ron wryly described the time when he was travelling through the forest loaded up with Mortars, ammunition, a few servicemen in the back and an officer up front, they suddenly veered off the road and headed for the trees, ending up down a slope with the lorry's contents all over everyone including the officer. Who was driving it was Ron of course!

At the height of the airlift, fully loaded Allied Aircraft were landing 'one every minute'. Ron relayed how the Russians tried hard to stop these landings by overflying the airfield and sometimes actually landing and taking off, frustrating the allied pilot's approach runs. On a couple of occasions this ended in tragedy with a total loss of life in both Russian and Allied aircraft crews.

Not all of Ron's time was spent on the Gatow base, he volunteered for a large games event entering as a Javelin thrower despite having never thrown one before. To his surprise came 5th overall.

Time off- base was spent sometimes in Berlin where events could get 'lively' at night and another off-base excursion was in the mountains for 10 days skiing holiday. The excursion cost a total price of 10 shillings (in old money) all found, which even then would have seemed to be particularly good value.....!

In a final comment, Ron explained that the whole experience as an 18-year-old had had a profound effect on him and that he had "grown up very quickly" after returning to England and de- mobilised in 1950. What Ron experienced in Germany changed his attitude to life, enduring right through the remainder of his working life as a builder and to this day.

My thanks go to Ron, who kindly gave his time to recall his experiences, to Carol Poulton who helped organising the interview and the "two Mikes" who did the techie stuff.

Chris Ridley

MEMBERS MISCELLANY

Science History - Expansion of the Universe Nigel Bedford

Cosmology, is both an interesting but frustrating subject for 'laymen' to understand. The concepts and numbers are almost beyond comprehension but using the term 'history' may be very apt as what we are viewing has already happened, even the light from the surface of the Sun is 8 minutes and 20 secs in the past.

Nigel, in researching the concept of an expanding universe has revealed that even the greatest thinkers in science have been unable to agree on how the universe came into being or even what is happening to it at this present moment. In an effort to come up with a definitive theory astromers and mathmaticians, with the benefit of more sophisticated measuring techniques and data revisit 'old' theories to find which components match what is being studied today. Perhaps it will be a brave researcher who claims they have unlocked the secret of how the universe was created and will end.

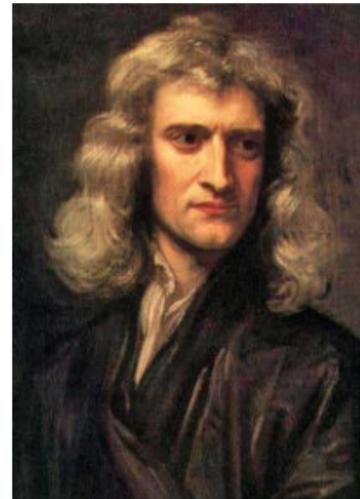
Possibly some of the answers will be found by Physicists who are studying Quantum Mechanics and how the smallest particles of matter and energy interact. Maybe we will never really know but human curiosity will always strive for the answer and we can only speculate where that will take us.

Science History - Expansion of the Universe - Nigel Bedford

We are currently at an exciting time as regards our understanding of the origins of the universe and its evolution. This is due to the possibility of the unification of theories of the very large, i.e. Gravity, with the theories of the very small, namely Quantum Mechanics. Although this has not yet been achieved, the structures that we observe in the current universe can be shown to be consistent with the quantum fluctuations that existed back in the early universe, and I mean **VERY** early, well within the first fraction of a second (10^{-32} to be more precise).

All of this change of understanding has happened since my early school years (mid 1960's) so I thought it would be a good idea to update myself with where we are now and how we got here. What follows is a brief history of the scientific progress relating to the expansion of the universe rather than a description of the current model of the evolution of the universe as it exists today. That, as they say, is another story.

HISTORY UP TO 1965

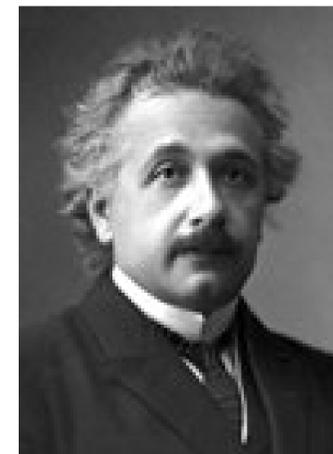


Isaac Newton started to formulate his laws of motion around the time of the plague (1665-6). He had left Cambridge temporarily and was "isolating" at his home at Woolsthorpe Manor when he started to play with the idea that the force that caused objects to fall to the ground was the same force that kept the planets in their orbits. This was a big leap of faith at the time. As you know this line of thought led to him developing his own mathematics (a form of calculus) and his three laws of motion.

This was the beginning of modern astronomy in the sense that it gave us the mathematical tools to quantify all sorts of celestial motions and confirm previously empirical results, e.g. Kepler's laws relating to elliptical orbits and rotation periods.

Newton thought that the universe was **a static entity**. His argument was based on an infinite universe comprising uniformly distributed bodies everywhere. He said that this would result in a net zero gravitational force on any one body as there was, on average, equal and opposite pull from all sides. We now know this argument to be erroneous.

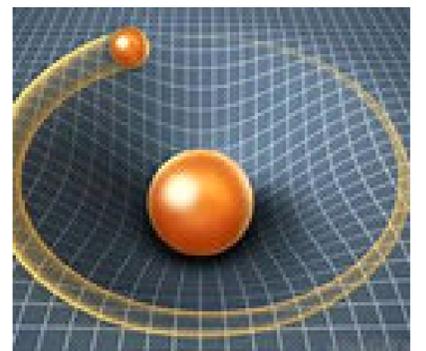
This static universe view and the belief that Newton's laws were the last word on the subject persisted until the latter part of the 19th century when observations had become sufficiently accurate to start to deviate very slightly from the Newtonian view. The rate of precession of the perihelion of Mercury being one example. The cracks in Newtonian physics had started to appear.



Along comes **Albert Einstein** in 1915 and turns everything on its head with his **Theory of General Relativity**. This theory introduced a completely different way of looking at gravity as a distortion of space and time. The solutions to his General Relativity Equations had a massive impact for the thinking in cosmology. They predicted that the **universe was not static**. Whatever closed surface you can imagine it will necessarily contain matter inside and this will attract all matter outside the surface.

Einstein did not like this prediction at all, so he introduced his famous cosmological constant into his equations (as a repulsive force) to balance the attraction and restore the static universe view.

There follows a period where various clever people developed Einstein's Equations and came up with a variety of cosmological models including expanding versions. These were just theoretical possibilities at this time.



MEMBERS MISCELLANY

Science History - Expansion of the Universe Nigel Bedford

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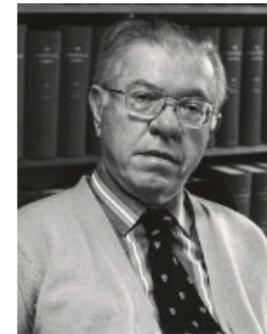
Nigel, in researching the concept of an expanding universe has revealed that even the greatest thinkers in science have been unable to agree on how the universe came into being or even what is happening to it at this present moment. In an effort to come up with a definitive theory astromers and mathmaticians, with the benefit of more sophisticated measuring techniques and data revisit 'old' theories to find which components match what is being studied today. Perhaps it will be a brave researcher who claims they have unlocked the secret of how the universe was created and will end.

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Science History - Expansion of the Universe - Nigel Bedford (continued)



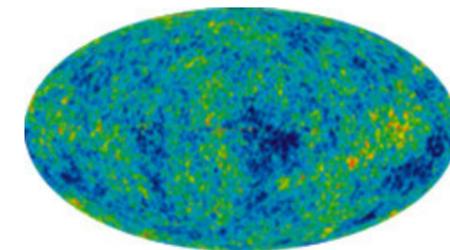
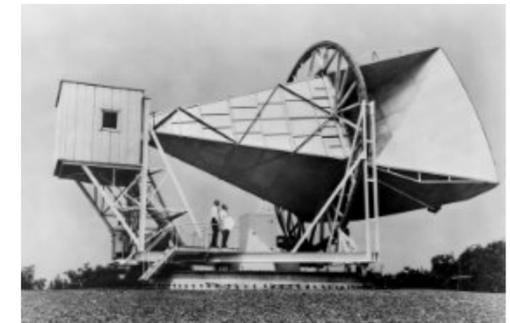
In 1935, **Edwin Hubble** (Upper Left) produced a set of experimental results that showed the recession velocities of distance galaxies were proportional to their distance from us. He did this by plotting his galaxy brightness (using carefully selected galaxies that act as standard candles) to get a distance estimate using the inverse square law against the redshifts in their spectra. This was another game changer and provided direct experimental evidence that the **universe is expanding**. (Note that we are talking about **space** as expanding, not the doppler effect that might be seen with local motions towards and away from us. Think of a sine wave drawn on a piece of elastic and then stretch it. The wavelength will stretch as well, become longer and hence redder).



Some astronomers did not like the ever-expanding version leaving large volumes of empty space behind. **Fred Hoyle** (left) proposed a steady state theory whereby matter was created in these voids hence maintaining the matter density of the universe more or less the same. He first coined the term **Big Bang** in a Radio 3 broadcast in March 1949 when describing the rival theory to his own steady state version.

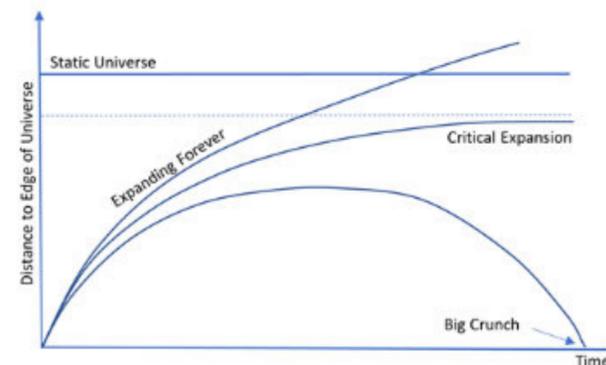
In 1965, **Arno Penzias** and **Robert Wilson** working at the Bell Labs, New Jersey, were using a 6 metre horn antenna to detect low level radio signals. Even though they had cooled their receiver down to 4 degrees Kelvin they found that they couldn't eliminate the background noise to the level they required. Having ruled out terrestrial origins, including sweeping the pigeon droppings out of the horn, they concluded the noise came from outside our galaxy.

They measured it at 3.5 degrees kelvin. This is commonly referred to as the **Cosmic Microwave Background** or CMB. Since then, it has been measured much more accurately by satellites.



The CMB temperature fluctuations from the [WMAP satellite](#) data seen over the full sky. The average temperature is 2.725 Kelvin degrees above absolute zero. Red regions are warmer and blue regions are colder by about 0.0002 degrees. Shown in galactic coordinates. The centre of the picture is looking from the earth towards the centre of the galaxy, the galactic disc is horizontal. (The effect of our galaxy has been subtracted from this plot)

The CMB discovery was another game changer as this was the evidence for the remnant of the Big Bang which had cooled down. Fred Hoyle's steady state theory was now dead in the water. In spite of all the evidence to the contrary, Hoyle continued to propose the steady state theory until his death in 2001. The CMB represents the furthest distance we can see and occurred about 380,000 years after the Big Bang. This is the time at which the universe had expanded and cooled sufficiently to become transparent to photons. Prior to this time, it was an opaque "soup" of exotic particles. This was the state of play when I was at school and the cosmological models prevalent at that time can be summarised in a simple graph (lower left) which many of you will have seen.



The vertical axis represents the distance to the edge of the universe whilst time is shown horizontally. The graph shows the Newtonian static version being superseded by three possibilities of Big Bang, namely, expand forever, expand and then contract back into the "**big crunch**" or somewhere in between called the "**Critical Expansion**" approaching a finite limit. The analogy here is a vertically moving rocket having sufficient velocity to escape the Earth's gravitational pull. Based on the experimental evidence at this time the expansion rate was very close to the critical case, there was insufficient accuracy to determine if we were actually within one of the other two scenarios.

MEMBERS MISCELLANY

Science History - Expansion of the Universe Nigel Bedford

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Science History - Expansion of the Universe - Nigel Bedford (continued)

HISTORY AFTER 1965

This state of knowledge existed from the mid-1960s until about 1990. During this time there emerged three problems with this understanding.

The first was the fact that the universe would have had to have been incredibly uniform at the outset in order to explain the currently observed homogeneous (on a large scale) distribution of matter.

The second is that the **Cosmic Microwave Background (CMB)** is uniform, to within 1 part in 10,000, across the whole sky. Given that the photons from this background have only just reached us, how is it that opposite sides of the sky appear to have the same temperature when they haven't been able to interact with each other.

The third was the lack of evidence for the existence of magnetic mono-poles. **Grand Unified Theories** predict their existence, yet none have been found experimentally.



The next major step occurred in 1990 when **Alan Guth** (left), an American cosmologist, proposed his theory of inflation. This theory is effectively a "prequel" to the Big Bang. The conventional big bang theory at that time really started with the primordial "**soup**" of plasma. It didn't say what banged and why it banged.

In this theory, at the beginning everything was in very close proximity and was subject to quantum fluctuations. This was followed by a rapid phase transition (an example of a phase transition is water changing to steam) where the universe suddenly expanded by about 78 orders of magnitude in volume. That is 10^{78} or 1 with 78 zeros, or equivalent to 1 nanometre expanding to 10.6 light-years! This is **Cosmic Inflation** and it took place approximately between 10^{-33} and 10^{-32} seconds after time "zero". It solves the three problems of the earlier models. It has the effect of smoothing out the initial quantum fluctuation inhomogeneities to become consistent with today's observations. It also explains the high uniformity of the CMB as the universe was causally connected prior to the rapid inflation. The lack of discovered mono-poles is explained simply by the massive dilution effect of the expansion.



During most of the 1990's the cosmology model was looking pretty good until in 1998 another ground-breaking discovery was made. A couple of teams of astronomers, led by **Saul Perlmutter** (left) and **Adam Reiss**, (right) had been measuring the gravitational red-shifts of very distant galaxies. They discovered that these galaxies were receding more rapidly than the conventional Hubble expansion theory would predict. This meant that the expansion of the universe, far from slowing down, was actually accelerating. No longer is gravity gradually slowing the expansion and, for the last 4-5 billion years, some repulsive force is now taking over. The famous cosmological constant that Einstein had introduced to create a static model has now returned with a vengeance. The cause of this repulsion is the often referred to "**Dark Energy**", also called the Vacuum Energy. It is the energy of the vacuum. As space expands it creates more vacuum, hence the energy of the universe increases.

So, there we have it..... the story so far.

The current estimate of the age of the universe is about 13.8 billion years. It started with a volume less than that of a proton and it has passed through a massive inflationary period and radiation dominated phase during the early expansion until it has cooled sufficiently to become transparent (CMB). Since then, for about 9 billion years, matter coalesced under the force of gravity and the stars and galaxies formed (called matter dominated phase) whilst the expansion was slowing down. In the last 4-5 billion years the expansion has started to accelerate and we are now in the Dark Energy dominated phase.

Nigel Bedford

MEMBERS MISCELLANY

MG Cars 1924 to 1939

Geoff Dean

This is the first of a series Geoff has promised us on famous British marques.

Morris Garages was formed in 1920 and owned by William Morris. They became best known as a tuning company possibly using the MG name, similar to Mercedes Benz and AMG today. In 1930 the **MG Car Company** was formed, still owned by William Morris who in 1935 'sold' it to Morris Motors Ltd. MG carried on as a recognisable brand until Morris Motors became part of the British Motor Corporation in 1952 and subsequently, British Leyland in 1968 and finally the Rover Group in 2000. The Rover Group went into receivership in 2005 and the MG 'brand' is now owned by the Chinese state motor manufacturer SAIC Motor Corporation.

The period in MG history described by Geoff is perhaps the 'golden' years in MG history, the cars were distinctive and popular, trading on their competition successes. Most of the two-seater models evolved slowly through different model types but were always recognisable as MG's



Cars 1924 to 1939 - Geoff Dean



William Morris began his career in 1893 when he set up a bicycle repair shop in Oxford. He progressed to making bikes and experimented with motorcycles. In 1902 he opened The Oxford Garage where he sold and repaired bikes, cars (he was an agent for Humber, Singer, Standard and Wolseley among others) and operated a taxi service. He was so successful that in 1910 he moved his business to huge purpose-built premises and renamed it The Morris Garages.

By the time Morris moved into car manufacturing in 1913 he owned a chain of repair and sales garages around Oxford, all trading under the Morris Garages name. Whilst Morris Motors was a publicly traded company, Morris Garages was always Morris' own personal property built up from humble beginnings using only generated revenue. The Morris Garages continued to sell other cars alongside Morris badged vehicles making William Morris one of the few industrialists to profit from sales of his competitors' products.



In 1921 Morris appointed Cecil Kimber as sales manager for Morris Garages. Kimber had been an amateur motorcycle racer before he moved on to modifying cars and then becoming an engineering assistant at a component supplier that counted Morris Motors amongst its major customers. Kimber quickly began offering Morris Garages' customers the option of a few mechanical tweaks to their cars along with custom body designs which were significantly racier than the standard Morris Cowley bodywork.

In 1922 Kimber was promoted to General Manager and he gradually turned Morris Garages into a dedicated tuning firm. Whilst he was undoubtedly a passionate car and racing enthusiast, he also had a hard head for business saying that he could make cars that were "ten per cent better than standard but which can be sold for a fifty per cent higher price". Exactly when Morris Garages began building cars which would later become recognisable as 'MGs' is a matter of some debate, since it is hard to pinpoint when Kimber's products stopped being merely modified Morris cars and became something else.



In 1924 William Morris decided to formalise Morris Garages as a performance tuning and racing arm of his business. It was also the year when the first recognisable MG model was created – the MG 14/28 Super Sports - which was a Morris Oxford with a tuned overhead valve Hotchkiss engine and a hand built aluminium body. The same year they built their first dedicated racing car for an organised competitive event. That car was 'Old Number One', a modified Morris Cowley. The car won a gold medal at the 1925 Lands End Trials and brought the Morris Garages brand to the attention of the motor racing fraternity. Whilst the radiator of Old Number One bore the Morris Roundel, there was a new racing emblem designed by Kimber himself – the letter 'MG' surrounded by an octagon.

MG 14/28 Super Sports Customer Road Car



It should be mentioned at this stage that the Wolseley Company went into liquidation on 1 November 1926 and was subsequently bought by William Morris and renamed 'Wolseley Motors 1927 Ltd'.

MG 14/28 Super Sports 'Old Number One' Racing Car

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Cars 1924 to 1939 - Geoff Dean (continued)



M - Type

In 1928 MG was registered as a distinct entity – the 'MG Car Company Ltd'. The new operation was given dedicated premises in 1929 when Morris bought the former Pavlova leather factory in Abingdon, just a few miles south of the main Morris plant at Cowley. Previously, MG's had been built in a corner of the Morris radiator plant. MG needed more space due to the phenomenal success of its new model – the M Type (better known as the Midget).

By 1930 the popular M Type was a main competitor to the Austin 7 sports models and the Triumph Super 7. Some 3,325 cars, including two-seater sports and Sportsman's Coupé, were made between late 1928 and mid-1932.

The M Type had a four-cylinder overhead camshaft engine (based on the Morris Minor unit) driven through a vertical dynamo with a capacity of 847 cc generating, initially, 20 bhp at 4000 rpm and, after 1930, 27 bhp at 4500 rpm. The gearbox was three speed non synchromesh, and the bolt-on wire spoke wheels had 8-inch cable operated brakes.



J - Type

MG produced 29 different models of cars from 1928 through to 1939. By volume, the biggest sellers were the J2 type Midget (2,083 built), the L1 Magna (486 built) and the L2 Magna of which only 90 were made.

The 9 types of Magnette models totalled 1,181, all with six-cylinder overhead camshaft engines driven through a vertical dynamo. These were built from 1932 to the end of 1935.



Magnette KN University Special



L1 Magna

Then followed the four-cylinder PA and PB models, a total of 2,499 were built in 1934 to 1936. The TA Midget was then introduced which had a four-cylinder pushrod overhead valve engine of 1291 cc generating 52 bhp at 5000 rpm. The car had a manual four speed part synchromesh gearbox and 9-inch Lockheed hydraulic brakes. About 3,500 two seaters, Airline coupés and a drophead coupé were produced – the highest number of MG type models made to date.



1934 PA 4- Seater Tourer

MEMBERS MISCELLANY

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Cars 1924 to 1939 - Geoff Dean (continued)



Type TB

In 1939 a similar model to the TA was manufactured, known as the TB. A total of 379 two-seater open sports and drophead coupés were produced. They had a four-cylinder pushrod overhead valve 1250 cc engine generating 54 bhp at 5200 rpm. The gearbox and the brakes were the same as the TA.

MG made 2,738 of a model known as the SA in 1936. There was a stylish saloon, four-seater tourer and Tickford bodied coupé. Production continued until the outbreak of World War Two. The six-cylinder pushrod overhead valve engine had capacity of 2280 cc (later models increased to 2322cc) generating 75.3 bhp.

From the summer of 1937 until late 1939 a 1.5 litre model the VA was manufactured. The range comprised a four-door saloon, four-seater tourers and Tickford bodied four seater coupés. A total of 2,407 were made.



Tickford Body VA

The last pre-war model was the 2.5 litre WA. Again, the range comprised four door saloons, tourers and Tickford body cars. A six-cylinder overhead valve 2561 cc engine generating 95.5 bhp at 4140 rpm was used.

Examples of costs were:

MG TA Sports car	- £ 222 to £269
MG VA Tourer Saloon (12 hp)	- £ 280 to £356
MG SA Saloon (18 hp)	- £ 389 to £415
MG WA Saloon (20 hp) -	- £ 442 to £468



Type WA 4 - Door Saloon



Cecil Kimber - Morris Garages
Sales Manager



William Morris GBE CH FRS -
Lord Nuffield
Industrialist and Philanthropist

Part 2 of my article will cover the post-war MG models produced from late 1945 to early 1990's.

Geoff Dean

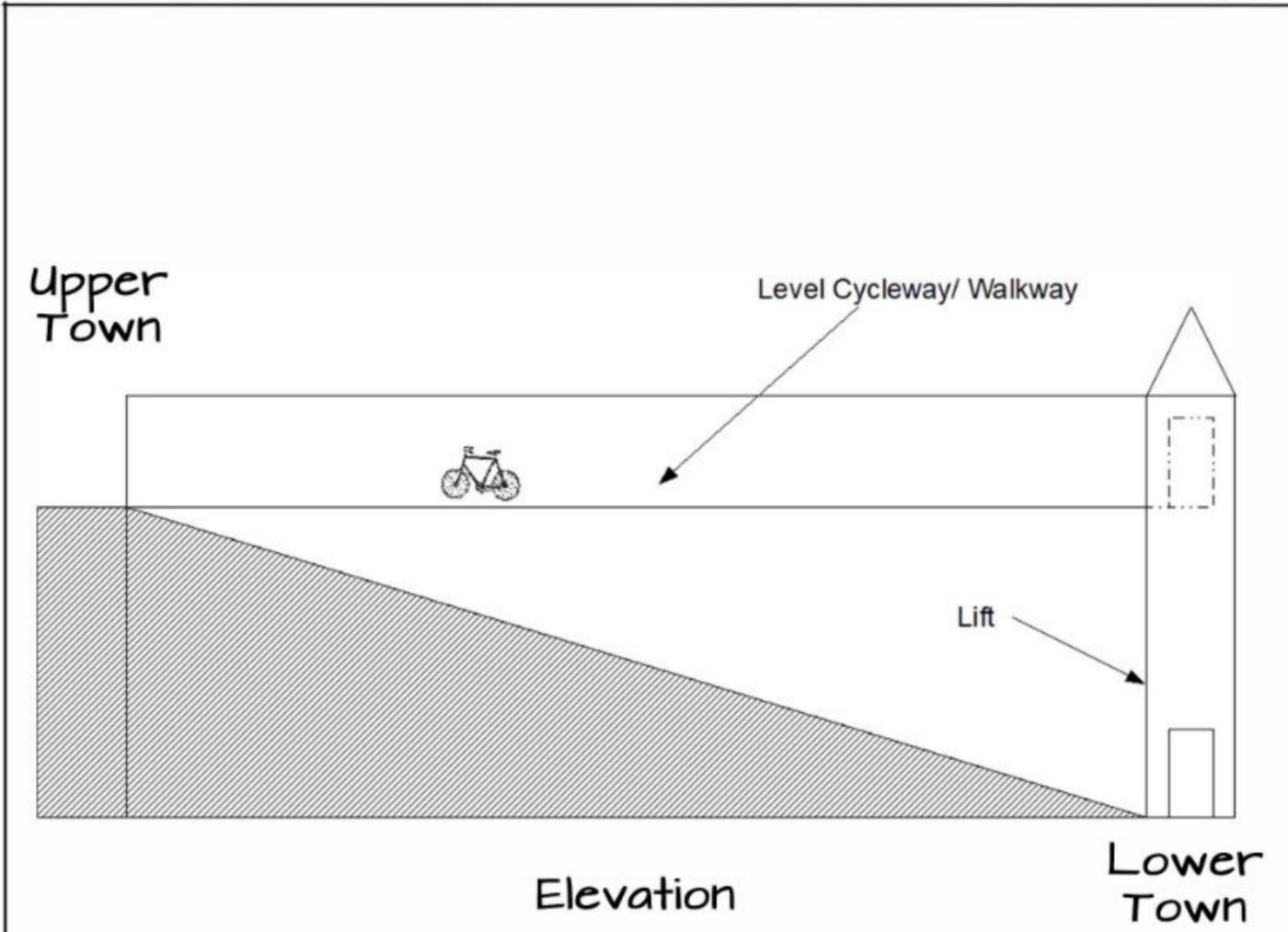
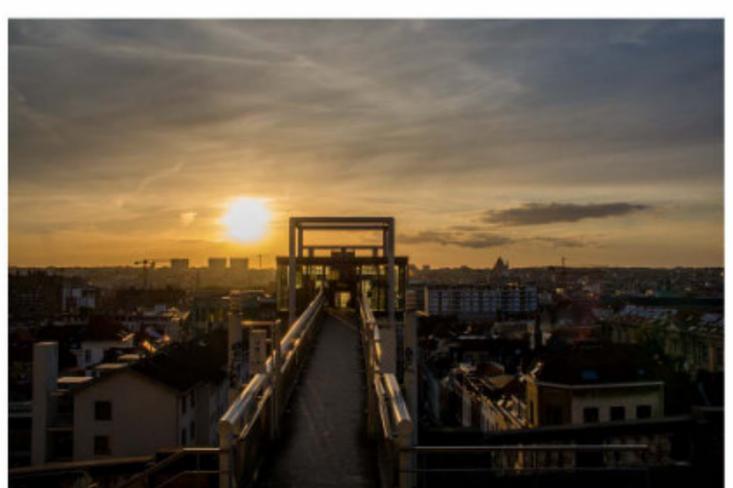
CORNER NINETEEN

19

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Inspired by the video we saw regarding the Trampe Bicycle Assist in Trondheim we invited members to offer their own solutions. On these pages we share the contributors ideas. At a future ESTG monthly meeting we shall invite each contributor to give us a brief explanation of their proposal.

We are still open to receiving proposals and will include them in further issues when they are submitted.


Elevation

Principle as found in Poelaert's cycle lift in Brussels - See pictures above

Title	Drawn	Checked	Date	Scale	
Cycle Assist Proposal	B. Rigby	ANO	04.2021	NTS	

CORNER NINETEEN

19

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Elevation

**Section X-X
Pedal Attachment
Detail and drive
arrangement**

OPERATION

Press start. Motor operates and carriage moves to a pre-determined start position indicated by a proximity switch.
Cyclist mounted on a cycle in normal way positions Left hand pedal in carriage cup
Cyclist keeps foot on pedal/cup to prevent leaving cup or back pedalling.
(A latch could also be fitted for this purpose.)
Top of assisted ride cyclist back pedals to release from cup.

Advantages Would accommodate most bike sizes within reason.
Pedal being offset from centre line of cycle means cycle runs on uninterrupted road surface

Disadvantages Cyclists with fancy toe clips

Title	Cycle Assist Proposal	Drawn	Checked	Date	Scale	
		D. Briginshaw	ANO	04.2021	NTS	

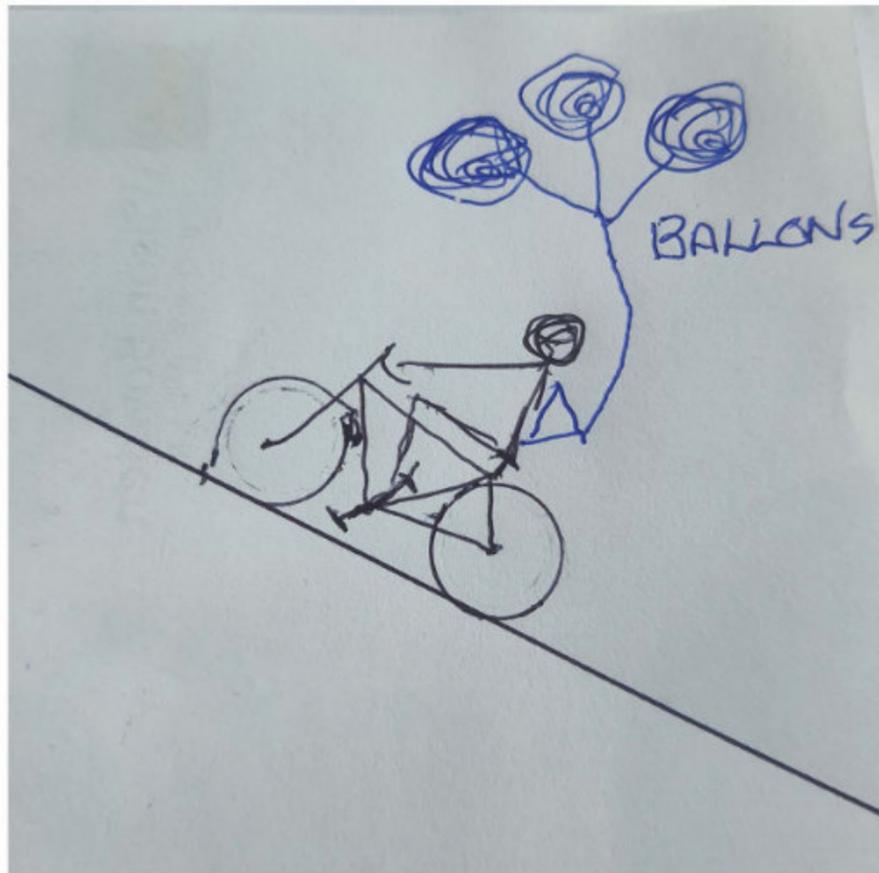
CORNER NINETEEN

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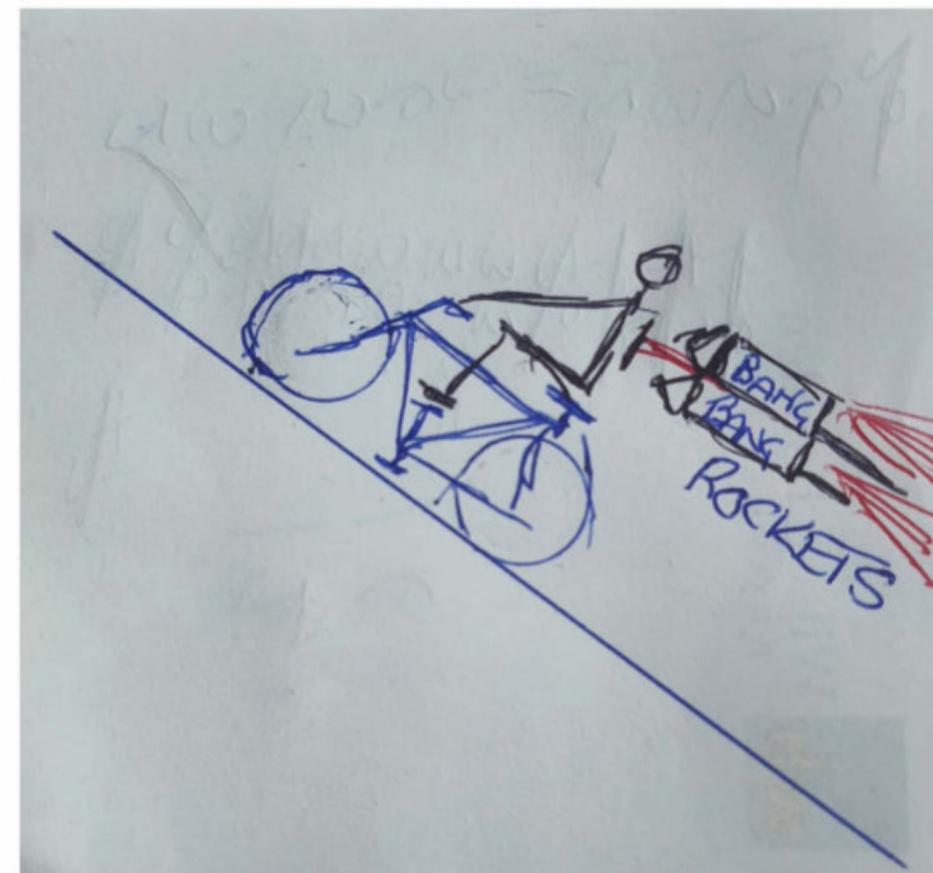
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Calculations are being carried out to assess volume / weight ratio to provide optimum assistance. As Helium is a finite resource, the option to use green Hydrogen is being considered. For additional assistance a controlled 'burn' maybe used which will also enable waste to be disposed of.



Re-usable rocket packs are being considered to reduce waste. Rocket packs will be delivered by vending machine on production of a token purchased locally. Once used, the packs will be collected via a vending machine at the top of the incline. The vending machine will return 75% of the hiring cost via a redeemable token if returned to local participating business's.

Title	Cycle Assist Proposal	Drawn	Checked	Date	Scale	
		I. Atchison	ANO	04.2021	NTS	

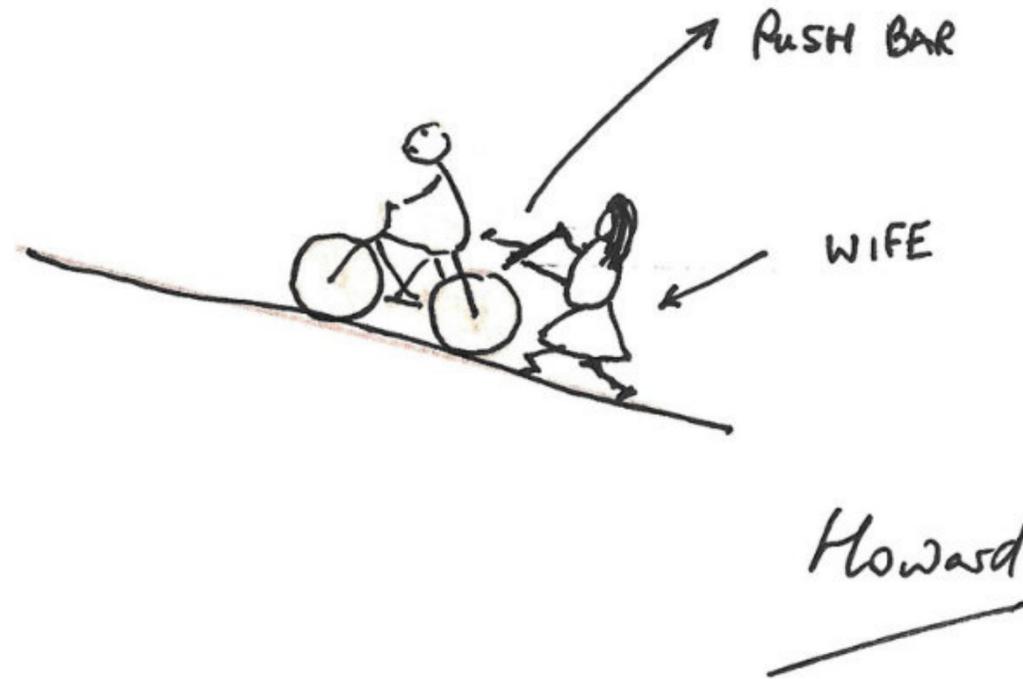
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The ESTG disassociates itself from the gender assertion of this prototype solution.

Tests carried out indicate that the motive power can be of any gender and does not require any familial association to work.

Provision would be made at the base of the incline for cardiac assessment and at the top for energy recovery via a postural support. A hydration regime will also be offered at nominal cost at the top of the incline.

Title	Cycle Assist Proposal	Drawn	Checked	Date	Scale	
		H. Grant	ANO	04.2021	NTS	

CORNER NINETEEN

19

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*Or just
ride one
of these !*

Alternatively, if you want to be ahead of the queue for your pension on a Thursday morning, choose this electric bike which has a top speed of 50 MPH.

