

Cowley Chronicle

March 2013

THE SPECIAL EDITION NEWSPAPER IN CELEBRATION OF 100 YEARS OF CAR MAKING IN OXFORD



William Morris (seated, in dark overcoat) in a two-seater 1913 Morris Oxford runabout.

CELEBRATING A CENTURY OF INNOVATION

A story of the exceptional vision and skill of many people at Oxford

The story of car making in Oxford is a unique journey through a century of industrial and engineering development. It is a story of 100 years of unrivalled technological change and the word which best sums up the plant's evolution, its people and the production processes is innovation. It is the vision and skill of many of the people involved in the story that has maintained the plant's position as a manufacturing leader in Britain as well as a vital part of the BMW Group.

In the early stages of car production at Cowley, the Morris Motors workforce started with an output of 20 cars a week, the teams working around stationary vehicles which were then manually pushed to the next workstation.

Today, Plant Oxford manufactures up to 900 cars every

day and is currently undergoing major investment. That includes the installation of 1,000 new robots in a new body shop and the existing facility in readiness for the next generation of MINI. This represents the lion's share of a £750 million investment programme, announced in 2011/12, which also sees the significant upgrading and installation of new facilities at the company's Hams Hall engine plant and the Swindon body pressings factory.

INSPIRATION

Oxford can be celebrated for far more than its substantial role during a hundred years of car manufacturing. It has been the source and place of inspiration for many landmark cars, not least the 1959 Mini, besides being a mighty engine of export through



Morris's business career started with the production of bicycles.

much of the 20th century, and definitely so during the 21st. It has also contributed substantially to the fabric of the UK and many other nations, not only by providing employment and generating wealth, but through the many charitable contributions of its founder Lord Nuffield, many of which continue to have a significant positive impact. Today the plant faces a bright future, the MINIs we produce are enjoying rising popularity all over the world and the plant is an essential element of the BMW Group.

Take a look back with us, in this special issue, into a past world and the origins of car manufacturing at Oxford and find out more about the history that lies behind our facilities and some of the people working here.

100 YEARS
CAR MAKING IN OXFORD
1913 - 2013

WELCOME . . .



A MAJOR MILESTONE

On 28 March, 1913, a century of car production began when the first Bullnose Morris Oxford was built just a couple of yards away from what we now call our place of work – MINI Plant Oxford.

One hundred years later, more than 11.65 million cars have been built here at one of the longest-established mass production car plants in the world. Created by William Morris, the story of our plant is a remarkable one and it would not have come this far without its skilled workforce. One hundred years of car manufacturing is a journey through industrial development, engineering innovation, social change and the evolution of the motor car.

I am more than proud to be part of Plant Oxford as it celebrates this grand milestone. Moreover, I'm proud of the workforce who lead this impressive history by building our current MINIs. This special edition newspaper is to say thank you and to commemorate this fantastic landmark.

Such a long history leaves us with the responsibility for the plant's future and its role within the BMW Group. And this year, we're not only looking back but more so looking forward to MINI's future with an exciting third-generation model in the pipeline.

So, let's keep on building – our history and MINIs!

FRANK BACHMANN

Managing director, Plants Oxford and Swindon

A MAN OF VISION

A LEADER AHEAD OF HIS TIME

Great contribution to the city and people of Oxford

The story of MINI Plant Oxford is inextricably linked to the life of William Morris, who became Lord Nuffield upon receiving a peerage in 1934. This remarkable man was equally an industrialist, an engineer, a businessman and a philanthropist with a lifelong interest in health and well-being. Importantly, he invested heavily in facilities to keep his workforce healthy.

On 10 October, 1877 William Morris was born in Worcester. His family moved to Oxford when he was three, settling at 16 James Street between Cowley Road and Ifley Road. At the age of 15½, Morris became an apprentice in the cycle repair trade. He set up his own business in the following year at the family home, where he repaired and built bicycles.

When his business became successful, he moved to new premises at 48 High Street, where he progressed to build motorcycles. With his passion for motor cars, he later began repairing, hiring and selling cars at a garage in Longwall. From that he pursued his vision to build his own motor car, the Bullnose Morris, which was the start of a hundred years of car manufacturing in Oxford.

PROSPERITY TO THOUSANDS OF OXFORD CITIZENS

Morris turned a small factory into a major industrial empire exporting cars all over the world. He retired in 1952 and died in 1963, aged 85, with no descendants, having lived a modest life.

His company delivered work and prosperity to thousands of Oxford citizens. In his lifetime, it is estimated that Morris gave away a sum equivalent to £11 billion at current values to charitable causes, often related to health and social welfare. Much of the money went into medical research. His donations created the



William Morris with a Morris Oxford Six Saloon.



The entire Morris works staff in 1903, with William Morris on the right.

Nuffield Foundation, Nuffield Health, Nuffield Farming Scholarships and the Nuffield College at Oxford University.

In the late 1930s, for example, Morris was shown an iron lung, which was used in the treatment of polio. He quickly turned over part of the Oxford plant to the manufacture of the respirator and supplied them,

without charge, to any hospital that asked for. During the polio epidemic of the 1940s and 1950s, he commissioned 5,000 iron lungs for use throughout the Commonwealth.

Everywhere in modern day society, the effect of Nuffield's remarkable philanthropy can be felt today.

Did you know..?

- ◆ In 1912 at the London Motor Show, Oly a London garage owner ordered hundreds of Bullnose Morris without having seen the car blueprints.
- ◆ In the very early days, the Morris Motors worked produced 20 cars a week.
- ◆ The two-seater Bullnose Morris Oxford launched on 28 March, 1913, costing £175.
- ◆ With the introduction of the Morris Eight in came a moving conveyor line to improve productivity.
- ◆ In 1939, the Morris factory became the British plant to produce a million cars.
- ◆ The Morris Minor notched its millionth sale in 1961, as the first British car to do so.
- ◆ When Lord Nuffield first saw the Morris he called it a poached egg.
- ◆ Total car production to the beginning of March stands at 11,655,000 and counting.
- ◆ More than 2,250,000 MINIs have been so far, plus 600,000 Minis manufactured at Oxford.
- ◆ Scores of models under 14 car brands have produced at the plant.
- ◆ The workforce grew to 28,000 in the 1960s.
- ◆ As well as cars, the plant produced iron refrigerators, Tiger Moth aircraft, parachutes, glide jerry cans, besides completing 80,000 repairs on Spitfires and Hurricanes.
- ◆ A principal part of the BMW Group's million investment for the next generation will be spent on new facilities at Oxford.



William Morris was a keen sportsman. In his youth he took part in bicycle races and won many titles and trophies as champion of Oxfordshire, Berkshire and Buckinghamshire.

THE EVOLUTION OF CAR MAKING AT OXFORD

BIRTH OF A MOTORING LEGEND

From local garage to worldwide company

The evolution of car production in Oxford and its workforce is a unique story through a century of industrial and engineering development. Who would have thought that the creation of a whole new suburb and 100 years of car building would follow when William Richard Morris started as a garage proprietor in the city centre?

This is a story of unparalleled technological evolution as well as a skilled and passionate workforce, which has made Plant Oxford and MINI so successful and a vital part of the BMW Group. With the third generation MINI at our doorsteps, the outlook for the plant's future is an exciting one. However, this would not have been possible without the past generations' hard work and their dedication to car manufacturing.

PRESSED STEEL BRINGS A REVOLUTION IN CAR BODY MANUFACTURE

Hand-building gives way to mass production

THE BODY SHOP

In the early days of mass production at Cowley, car bodies were hand-built. A range of steel panels were formed around a wooden frame and then manhandled on to the car's chassis.

However, during a trip to North America in the mid-1920s, William Morris was introduced to a process that would ultimately revolutionise car production in the UK. The entire body of the car was formed by pressed steel panels welded together to form one complete unit, or body shell, on to which the rest of the car was built.

Morris soon introduced 60 heavy steel presses and created a division called the Pressed Steel Company to manage this important new technology for the car-making process.

By the late 1930s, the processes had been further refined and body panels were now welded using hand-held welding guns suspended above the production line. The search for improved output was relentless as more processes became mechanised and less labour intensive. At the same time, the first monocoque body shell was developed, bringing the shell and chassis together into a single unit.

The 1980s brought the development of robot technology. Welding work on body shells was a task ideally suited to the emerging technology as previously laborious and time-consuming tasks were instead handled by computer-guided robots.

Today, the MINI first takes shape in the body-in-white facility. There are more than 500 robots in this body shop and body shell production is more than 95 per cent automated. This means that more than 4,000 welding points on the bodies can be completed precisely and quickly. Up to eight robots can simultaneously work on one body.

Plant Oxford's body shop is currently undergoing further major investment in readiness for the next generation of MINIs.

EARLY DAYS



Workers finish off wooden body frames for the panelling. In the sheet metal department, the wooden bodies were panelled with metal sheets (1925).



Body sections are fitted on jigs in the body shop (1925).

TODAY



Robots weld and fix parts to the body as MINIs are moved through on a conveyor belt (left). Associates carry out quality checks on the finish line.

TURN OVER TO SEE HOW THE PAINT SHOP AND ASSEMBLY LINE HAVE CHANGED OVER THE YEARS →

EARLY DAYS



Workers had to rub down the body by hand before the painting began (1925).

SMOOTHING THE FLOW OF CHASSIS AND BODIES

Automation has always played a part

THE PAINT SHOP

The paint shop was among the first areas to benefit from attempts to rationalise the flow of vehicles through the production process.

Even by the start of the 1920s, part-assembled chassis were pulled from the main production line on to turntables so they could be manoeuvred into one of four paint booths. Once in the booth, the chassis was rotated in a cradle, allowing two men to spray it in a matter of a few minutes. Once painted, the chassis were pulled through drying kilns by a system of chains and then sent on to the next production line process.

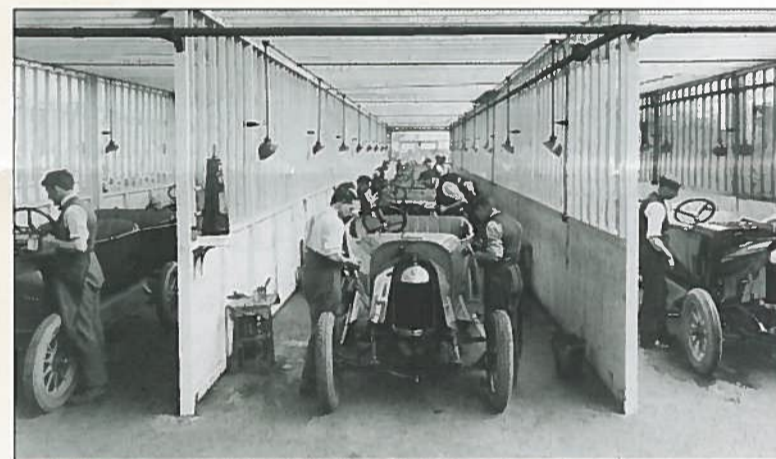
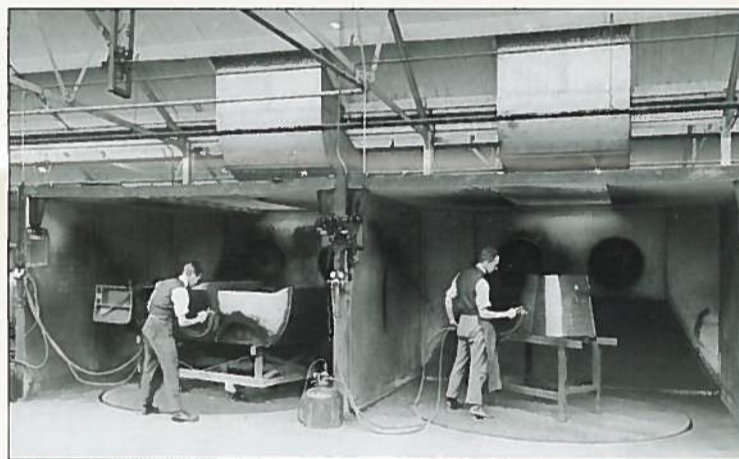
However, even as late as the 1970s, the paint process was still labour intensive as body shells were rubbed down, or 'flatted', by hand between the various coats of paint. It was not until the 1980s that the entire paint process became fully automated.

In the most recent times, Plant Oxford has benefited from major and ongoing investment. Typical of this is the highly efficient Integrated Paint Process (IPP), which is having a long-term impact on energy saving and emission reductions in the painting of body shells and meets BMW Group's high quality standards.

Compared with previous technology, IPP eliminates the primer coat application and oven stage, yet achieves the same high standards as conventional paint processes in terms of optical and protective qualities.

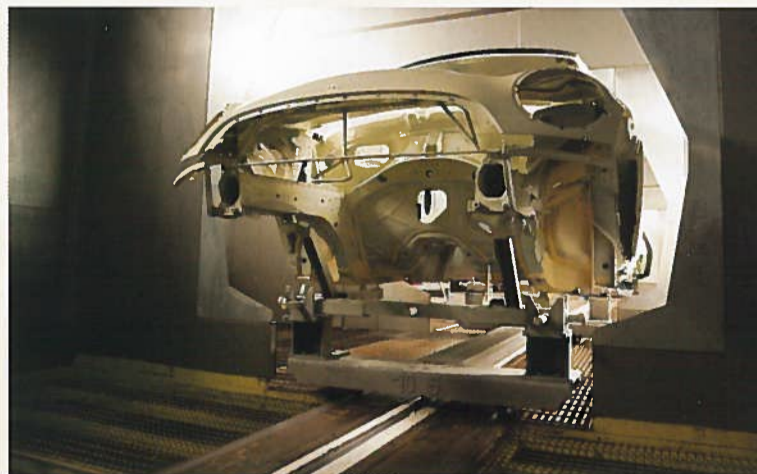
One of the most striking elements of the paint shop process is the use of female ostrich feathers to remove any dust traces before the colour paint layer is applied. The feathers are used because they have a natural static charge not found to the same degree in any other material and so are highly efficient at attracting even tiny particles of dust.

The new MINI paint facility was the UK's second biggest building project in its year of construction (after the Millennium Dome) and cost £80 million. It covers 38,430 square metres – that's six football pitches.



Above: The Bullnose Morris spray painting bays (1925). Right: Bullnoses, complete with radiators and wheels, are pushed into parallel booths where they receive a final coat of paint under bright lights to detect blemishes (1926).

TODAY



State-of-the-art technology in the current paint shop: MINI body shells leaving the oven (above left), being sprayed in the paint booths (above right and below) and on the polishing line (below right).



CAR MAKING AT OXFORD

20 CARS A WEEK TO ONE EVERY 68 SECONDS

At the forefront of innovation

THE ASSEMBLY LINE

In the very early days, the Morris Motors workforce assembled cars from largely bought-in components and started off with an output of 20 cars per week. The team worked around the static car, adding components to gradually build up a complete vehicle.

Into the 1920s, the layout of production facilities was constantly evolving to create a better flow, with the unfinished cars being manually moved along tracks from section to section and workers concentrating on specific activities. Slave wheels were used to carry the part-assembled cars before finished wheels and tyres were fitted towards the end of the line.

By the 1930s, the plant had one of the first moving production lines in Europe and by 1932 it was Europe's largest integrated car plant. To help meet ever-increasing demand for Morris cars, the part-finished cars were now pulled along the production line on a pulley system instead of being pushed by hand.

The Morris Eight, introduced in 1934, marked another big step up in the volume of production at Plant Oxford. Automation within the factory was an ongoing process and helped the company build its millionth car in May 1939.

The introduction of robot technology in the 1980s delivered another major boost in production. Today, Plant Oxford's associates use state-of-the-art production lines to complete one MINI every 68 seconds and an impressive 900 cars every day.

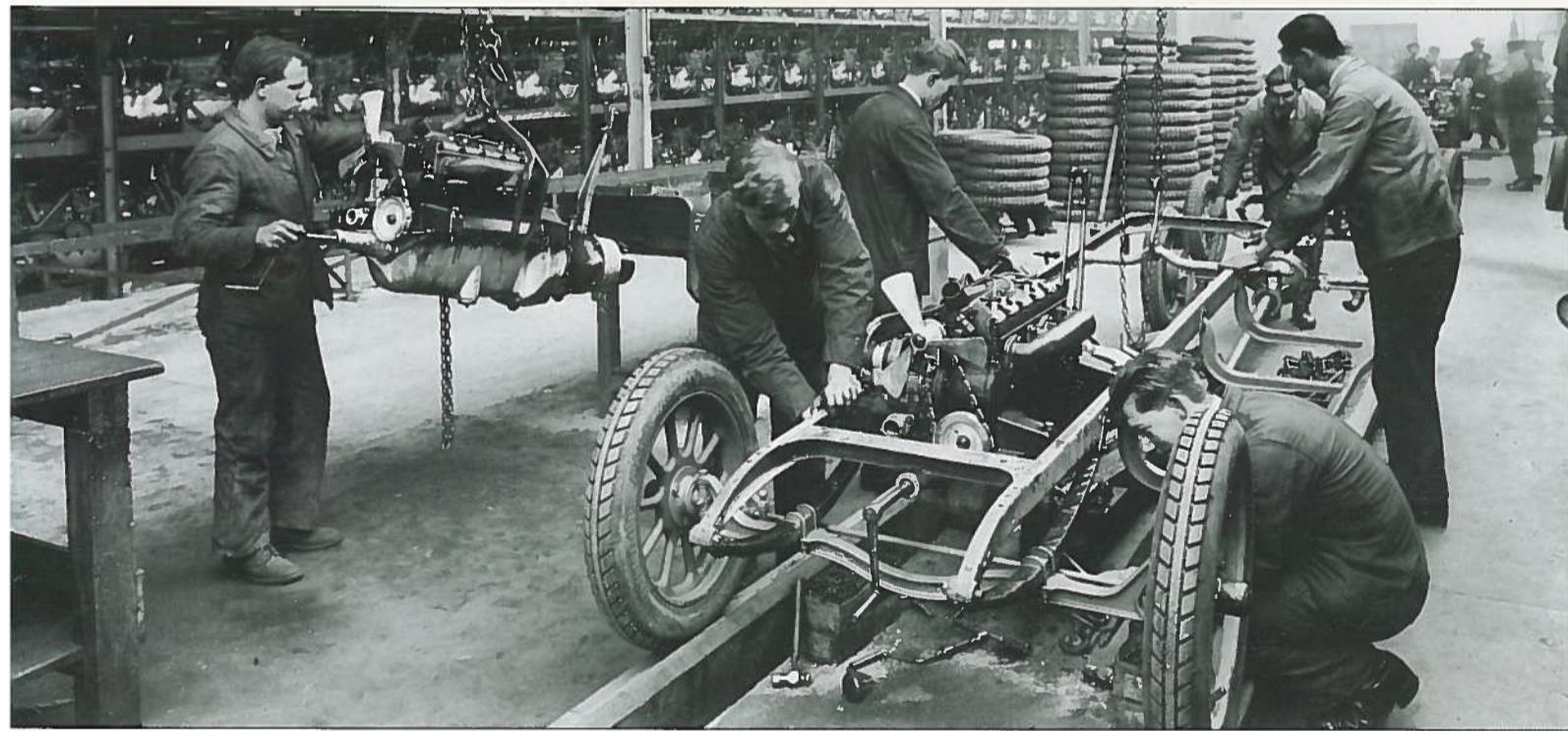
EARLY DAYS



Associates working on the assembly line for power unit accessories.



Petrol tanks are now delivered by a supplier, but in the early days they were made in the Tinsmith's Shop.



Erecting Shop: Workers gauging chassis components.



A department made all the interior trim.

Engine and back axle units were manually assembled on the Chassis Assembly Line. This was a labour-intensive process, which involved two men on each unit.

TODAY



Above: Improved ergonomics: The rotary slings make it much more convenient to fit parts such as brake pipes underneath the car body. Right: The engine marriage is now a highly automated process. Associates carry out quality controls.

HOW TIMES HAVE CHANGED: A GLI

Ben's proud to keep a family tradition alive

Four generations of Tinsons have worked at the site since 1950

APPRENTICE BEN TINSON, 2013

"I am 16 years old and a first-year technical apprentice at Plant Oxford, currently learning about maintenance. A normal working day includes a group meeting at the start to discuss any problems, then we have an hour or so of theory with our teacher in order to be able to progress with the practical work.

"I enjoy the practical side of the apprenticeship the most as I am a hands-on person and I love taking things apart. The level at which we are being taught is very high and the equipment we are being trained on is good quality.

"Working at Plant Oxford and being the fourth generation in my family to do so makes me very proud. My family links played a big part in choosing to work here, mainly because my dad and grandad are always talking about their time working here."



Ben working in the training school.

APPRENTICE RAY TINSON, 1950

Ray, Ben's grandfather, joined Pressed Steel Ltd in 1950 as an apprentice machine tool fitter. He finished his career taking early retirement in 1980 from his post as works engineering and maintenance manager.

"I was 16 when starting at what was called at the time Pressed Steel Ltd and there were few of us taken on. It was a frightening experience, each apprentice being told by the head of the department what was expected of them and a programme of work was set up.

"Within works engineering there was always a good variety of work, each day being completely different due to varying activities. I think some of the other apprentices were quite envious. Those who worked in the machine shops and tool rooms were restricted to their bench while I had complete freedom of movement.

"Our main tasks were to endeavour to learn from the skilled man you were with, bearing in mind there were no teachers or special training facilities on site. You were only as good as the skilled men you were with.

"During the compulsory six months' training in the works engineer's drawing office, I was asked if I would like a transfer to be a draughtsman, which I agreed to. My apprenticeship was then extended to 10 years to give me sufficient time on the drawing board.

"What strikes me most when my grandson Ben tells me about his current apprenticeship is how well planned everything is and that there are teachers appointed to train in specific tasks, e.g. machining, fitting, electrical."



Ray at his drawing board in 1958.



Peter Tothill, who died earlier this year.

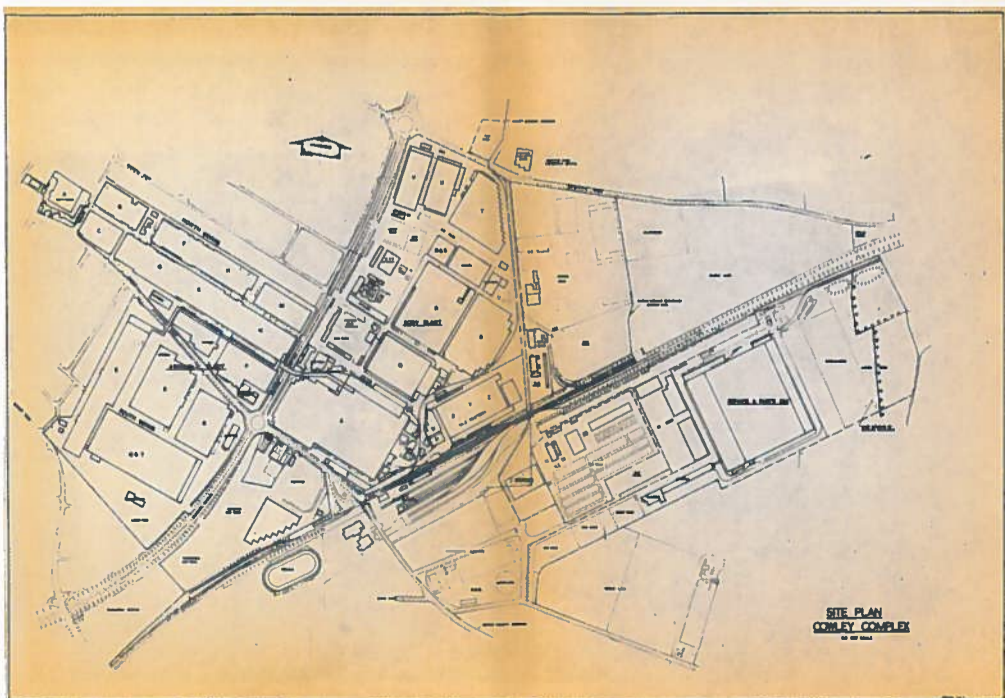
Mike's computer



MIKE YEOMANS, 2013

What started with pencil and paper in the earliest stages of car manufacturing has now evolved into a high-tech process. Engineers work with computer-aided design (CAD) to construct cars and evaluate a model's compatibility with series production before even building the first prototypes.

The virtual design studio in the Quality and



Plant map from April 1977.



The Drawing Office in 1959.

LIVES OF...

IMPACT OF COWLEY OVER THE YEARS



Far right: A page from Peter's recollections and prototype Mini project drawing by Sir Alec Issigonis.

Peter helped develop BMC's 'highly secret' new model

Engineer worked alongside Issigonis

PETER TOTHILL, LATE 1950s

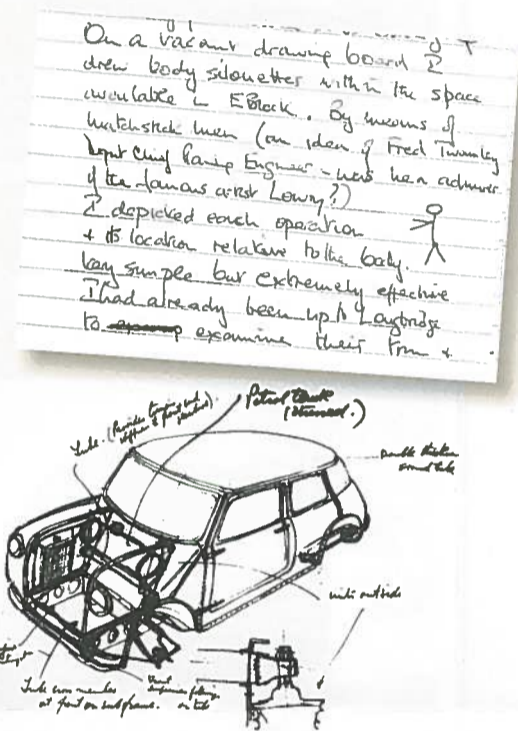
Peter Tothill, who died at the beginning of January this year, was a former production engineer employed from 1950 until 1982.

He began his automotive career in vehicle development for BMC at Cowley before moving to production engineering, where he worked with Sir Alec Issigonis on the Mini.

Peter had earlier told us: "Some time towards the end of 1957, the chief planning engineer called me into his office and said there was a new, highly secret model coming and that he wanted me to deal with it from scratch. There you are – a brand-new model and the opportunity to design a brand-new facility. So where the hell to start?"

Early in 1958, Peter had been allocated the third prototype for a week when he and his team carried out a strip and build exercise. "This car was far from the final production specification; the engine was installed with the induction and exhaust facing forward," he said.

As a next stage, Peter established an assembly precedence schedule and determined where each fitment operation could be laid out: "By means of matchstick men, I depicted each operation and a location relative to the body. Very simple, but extremely effective."



is the modern-day drawing board



Engineering Centre (QEC) at Oxford displays such CAD drawings on a 3x4-metre screen. The studio can hold up to 30 people who can simultaneously view the high-definition, computer-generated pictures displayed by a back projector.

As the product and process integration manager, Mike is looking after what Peter Tothill (see story, above right) used to do 56 years ago – simply on a different scale, with the

aid of computer technology and an average of two model derivatives being introduced into series production each year. He said: "Computer-aided design has been around for more than 20 years. But now, with improved graphics, it is moving out of the design department and becoming a mainstream tool. What was pen and drawing board 100 years ago is now CAD in the digital age!"

Mike is pictured in the virtual design studio at Oxford.



Dougie, 91, has lots of fond memories

DOUGIE BROWN, 1936

While today's new apprentices will be stepping into a state-of-the-art manufacturing facility with a brand-new training school, things looked rather different for the 14-year-old Dougie Brown starting his toolmaker apprenticeship 77 years ago. He came to Pressed Steel Ltd, on the site of the current Oxford plant, in the winter of 1936.

Dougie, 91, from Cowley, said: "It was very noisy because of all the big presses. I was making small jigs and tools. It was a very friendly place."

When war broke out, he told his manager that he was going to join the Navy: "He told me that my old job would still be here if I wanted it when I came back – and it was."

Dougie continued to work at Plant Oxford until his retirement in 1985. To date, 13 members of his family either have worked or continue to work at the plant, including his sister, Dot, who worked in the trim shop during the war, and his granddaughter, Claire Payne, who works in HR and is currently on a sabbatical in Germany.



Top: Dougie with his granddaughter Claire Payne. Above: Posing in the pressing technology section in T-Building Plant Oxford.

100 YEARS OF CAR MANUFACTURING AT OXFORD

REMEMBERING SOME OF OUR MAJOR MILESTONES



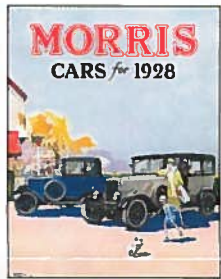
1913: William Morris produces his first car, a Morris Oxford Bullnose.

1919: Morris Motors formed to take over the assets of W.R.M. Motors, which Morris liquidated in order to free himself of certain agency contracts.



1924: The first special-bodied sporting Morris is produced out of the William Morris-owned Morris Garages, to create the first MG.

1924: Morris Motors outsells Ford for the first time, to become the country's best-selling manufacturer.



1925: Morris Motors sells 54,151 cars to win 41 per cent of the UK market, the highest share the company will ever attain.



1926: General Motors offers William Morris £11 million for his business, but is rebuffed.

1926: William Morris and American body-maker Budd formed a joint venture to found the Pressed Steel Company on the site now used for MINI manufacture.



1926: Production of the now famous Bullnose Morris ends.

1926: Morris Motors goes public with a share issue.

1927: William Morris buys Wolseley Motors for £730,000, outbidding Austin and General Motors. He describes it as "the most thrilling day of my life".



1927: Leonard Lord is drafted in from Wolseley to improve Cowley's production methods, which by 1936 he had transformed with a moving assembly line, a new paint shop and many new buildings.

The history of car production in Oxford started in the heart of the city with garage owner William Richard Morris, who produced bicycles and motor bicycles.

The development of a whole suburb started with

Morris's ambition to produce his own motor car. He pursued his vision and built vehicles in volume on the ex-military academy in the village of Temple Cowley on the city's outskirts.

The first production car left the W.R.M. Motors factory for a London dealer on 28 March, 1913.

1928: Original Morris Minor launched.



1930: Morris Motors takes majority control of Pressed Steel.



1934: Leonard Lord streamlines the Morris range and launches the Eight, which becomes Britain's best-selling car of the decade with 230,000 sold.



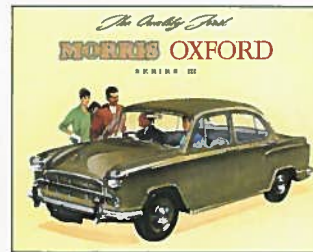
1935: Pressed Steel becomes independent, supplying both Morris Motors and manufacturers including Ford, Rover, Rolls-Royce and Hillman.

1936: The Nuffield Organisation is formed, consisting of Morris Motors, Wolseley Motors, the MG Car Company, Morris Commercial Cars, Morris Industries Exports and the SU Carburettor Co.

1939: Morris Motors produces its millionth vehicle.



1948: Sir Alec Issigonis-designed Morris Minor launched.



1952: Morris Motors merges with the Austin company to form BMC, the British Motor Corporation.

1952: William Morris – now Lord Nuffield – retires.



1959: Morris Mini-Minor (and Austin Seven) launched.



1961: Millionth Morris Minor produced, the first British car to reach this milestone.



1962: Morris 1100 launched.



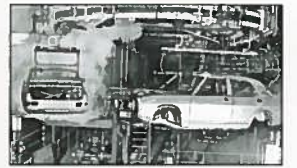
1965: Production at Cowley reaches 7,500 cars a week. Brands include Morris, Austin, Riley, Wolseley, Austin Healey and Vanden Plas.



1965: BMC takes over Pressed Steel, comb with its owner Fisher Body Company to create Steel Fisher. BMW now owns the former Press factory at Swindon.

1966: BMC merges with Jaguar to become Motor Holdings.

1968: BMH merges with Leyland to become Leyland.



1971: Morris Marina launched.

1974: Government is major shareholder in Leyland.



1981: Honda-based Triumph Acclaim launch



1988: The UK government sells the Rover to British Aerospace.

1994: BMW buys Rover Group.



1998: Rover 75 launched and produced at C

2000: BMW retains Plant Oxford after sell Rover Group to Phoenix.



2001: MINI launched.



2006: Second-generation MINI is launched.



2011/12: Investment programmes with bined value of £750 million are announced a Oxford in readiness for the third-generation MIN