CHESTERFIELD WFA

Newsletter and Magazine issue 42

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Welcome to Issue 42 - the June 2019 Newsletter and Magazine of Chesterfield WFA.

Our speaker on Tuesday 4th June is Rob Thompson - always a popular visitor to the Branch. We all tend to think of recycling as a `modern` phenomenon but in "Wombles of the Western Front- Salvage on the Western Front " Rob examines the work of salvage from its small beginnings at Battalion level to the creation of the giant corporation controlled by GHQ.

The Branch meets at the Labour Club, Unity House, Saltergate, Chesterfield S40 1NF on the first Tuesday of each month. There is plenty of parking available on site and in the adjacent road. Access to the car park is in Tennyson Road, however, which is one way and cannot be accessed directly from Saltergate.

Grant Cullen – Branch Secretary

Western Front Association Chesterfield Branch – Meetings 2019

Meetings start at 7.30pm and take place at the Labour Club, Unity House, Saltergate, Chesterfield S40 1NF

January	8th	**Jan.8th** Branch AGM followed by a talk by **Tony Bolton** (Branch Chairman) on the key events of the first year after the Armistice.
February	5th	Making a welcome return to Chesterfield after a gap of several years is **Dr Simon Peaple** who will discuss the `**Versailles Conference of 1919**`
March	5th	A first time visitor and speaker at Chesterfield Branch will be **Stephen Barker** whose topic will be the `**Armistice 1918 and After**`
April	2nd	No stranger to the Branch **Peter Hart** will be making his annual pilgrimage to Chesterfield. His presentation will be **"Aces Falling: War Over the Trenches 1918"**
May	7th	**John Beckett** Professor of English Regional History, Faculty of Arts at the University of Nottingham -` **The Chilwell Explosion Revisited**`
June	4th	**Rob Thompson** - always a popular visitor to Chesterfield Branch. We all tend to think of recycling as a `modern` phenomenon but in **Wombles of the Western Front- Salvage on the Western Front**` Rob examines the work of salvage from its small beginnings at Battalion level to the creation of the giant corporation controlled by GHQ.
July	2nd	In Prof. **John Bourne** we have one of the top historians of The Great War and he is going to talk about `***JRR Tolkein and the 11th Lancashire Fusiliers on the Somme***`
August	6th	**'Making the Armaments Centre of the World: Sheffield 1860-1914'** Dr. Chris Corker - University of York. The role Sheffield played in munitions production during the Great War is somewhat legendary. This talk examines some of the great names in the history of Sheffield steel in the build up to the war.
September	3rd	Back with us for a second successive year is **Dr Graham Kemp** who will discuss `***The Impact of the economic blockade of Germany AFTER the armistice and how it led to WW2***`
October	1st	Another debutant at the Chesterfield Branch but he comes highly recommended is **Rod Arnold** who will give a naval presentation on the `***Battle of Dogger Bank - Clash of the Battlecruisers***`
November	5th	Chairman of the Lincoln Branch of the WFA, **Jonathan D`Hooghe**, will present on the ***" 7th Sherwood Foresters - The Robin Hood Rifles"***
December	3rd	Our final meeting of 2019 will be in the hands of our own **Tim Lynch** with his presentation on ***" One Hundred Years of Battlefield Tourism"***

Issue 42 – list of contents

1 Meetings and Speakers Calendar
2 Contents Page + Personal Note from the Chair (34)
3 Secretary`s Scribbles
4 Book Group news & May meeting
5-19 May meeting
20 Amatol
21-28 Third Battle of Cambrai
29 – 36 British Fighting Tanks – Part 2
37 -40 Machine Gun Tactics – part 2
40 – 45 Death Over the trenches – the BE2 – Part 1

A Personal Note from the Chair (34)

We learnt this month of the passing away of branch founder member and stalwart , Malcolm Ackroyd . I have passed the condolences of the Chesterfield Branch membership to Pam and his family. Pam as many of you will know was branch treasurer for many years and Malcolm served on the Committee.

On a completely different subject I can report that after a two day battle with railway ticket machines and Trainline website chat line, I was able to attended my first Executive Committee meeting on June 1 and whilst it would not be appropriate for me to go into detail I can tell you that I was impressed by the amount of forward thinking and planning that went on. There are some really interesting proposals coming from the Irish Branches relating to reaching out to young people and over here, plans to build upon the Government's sponsorship of school visits to the Western Front. As Education Trustee I will be involved in a number of these initiatives and will be keen to ensure that our members have the opportunity to get involved.

Waiting for me when I returned from the Executive Committee meeting was a letter from David Humberston Chairman of the Leicestershire and Rutland Branch; you will probably recall that David came to talk to us about women spies in France and Flanders. In addition to his role as Chair of a WFA branch he is a trustee of the Friends of St George's Memorial Church, Ypres. Most visitors to Ypres will have visited the church at some time and David has brought to our attention the opportunity to support the Chaplain and congregation by offering the branch and individual members the opportunity of supporting the maintenance of the church. I will ask Grant to include the details in the next newsletter. It won't be possible to include it in this edition as Grant is as usual anxiously waiting for my late contribution before he publishes the newsletter.

Tony Bolton **Branch Chair**

Secretary`s Scribbles

Welcome to issue 42 of the WFA Chesterfield Branch Newsletter and Magazine.

We were saddened to hear of the passing, ten days ago of Branch founder member and former member of the Committee, Malcolm Ackroyd. Malcolm, whose health had been in decline for some time had always hoped to be fit enough to return to a branch meeting but it was not to be. As Tony has said he has passed on our sincere condolences to his widow Pam, his family and friends. Most of you will know, of course, that Pam was the Branch Treasurer from its founding in 2010 until a couple of years ago when Malcolm`s health issues meant she had to stand down.

Tuesday (June 4th) sees our next meeting with the return of the ever popular Rob Thompson. We all tend to think of recycling as a `modern` phenomenon but in **Wombles of the Western Front- Salvage on the Western Front`** Rob examines the work of salvage from its small beginnings at Battalion level to the creation of the giant corporation controlled by GHQ.

Moving forward a bit to August, the more eagle eyed amongst you will have noticed a change in the speaker for the August meeting. Due to circumstances beyond her control, Carol Henderson who was due to present to us can no longer do that. Last year I was given details of a potential speaker for 2019, Chris Corker, but this was just too late to include him in this year`s calendar. However Chris said to keep him in mind should a vacant slot occur. Well one has and I am delighted to say he has accepted the invitation to come and give us a talk on the developments of the heavy armaments industries of Sheffield which played such a big part when war came in 1914.

Two events coming up at which the Branch will have representation. In Queen`s Park, Chesterfield, Treaty of Versailles Thanksgiving Celebration Friday 28th June .

Saturday June 29th Worksop Armed Forces Day at Shireoaks Recreation Ground. There will be a flypast of a Douglas `Dakota` in `D-Day` colours.

I look forward to seeing as many of you as possible on Tuesday night – all welcome

Grant Cullen – Branch Secretary

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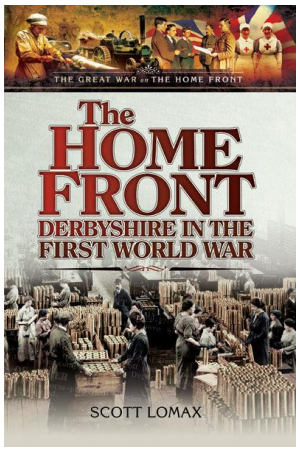
Any opinions expressed in this Newsletter /Magazine are not necessarily those of the Western Front Association, Chesterfield Branch, in particular, or the Western Front Association in general

Book Group

Our next Book Group meeting will be on Tuesday 25th June, 7pm in the Chesterfield Labour Club and we will discuss **"The Home Front, Derbyshire in the First War"** by Scott Lomax. I have invited the author to attend this meeting and talk about his book. He is hoping to be able to take up this invitation, subject to the demands of his `day` job



May Meeting

Branch Chair, Tony Bolton opened the meeting in our traditional manner in front of a very healthy attendance. He then welcomed our speaker for the evening **John Beckett** FSA FRHistS a historian who has been Professor of English History at the University of Nottingham since 1990.John was born on 12 July 1950 to William Vincent Beckett and his wife, Kathleen Amelia, *née* Reed. He completed an undergraduate degree at the University of Lancaster in 1971, which awarded him a PhD degree four years later for his thesis *Land Ownership in Cumbria, c. 1680-c. 1750*.

From 1974 to 1976, He was the Lord Adams Research Fellow at Newcastle; he then spent two years lecturing at Fairleigh Dickinson University's Banbury-based Wroxton College, and then lectured at the University of Hull for a short period before taking up a lectureship at the University of Nottingham in 1979. He was promoted to a readership in English regional history in 1987, and three years later promoted to his current professorship. John was also Director of the Victoria County History series from 2005 to 2010, and has served as chairman of a number of editorial boards, including that of the journal *Midlands History* (since 2001) and the History of Lincolnshire Committee of the Society for Lincolnshire History and Archaeology (since 1988). He has been chairman of the Thoroton Society since 1992 and chaired the British Agricultural History Society for four years from 2001. Becket is a historian of England in the eighteenth and nineteenth centuries. He is a local historian, and has studied topics relating to village life, Parliamentary enclosure and local politics, agricultural history, church history, and the history of landed estates and their owners. John was elected a Fellow of the Society of Antiquaries of London in 1992 and is also a Fellow of the Royal Historical Society as of 2018.

John`s presentation was on `The Chilwell Explosion Revisited`

At 7.10pm, in the evening of July 1st 1918, an explosion ripped through part of no. 6 National Shell Filling Plant at Chilwell in Nottingham. The blast was heard for miles around and windows were shattered in all the local villages.

12 year old Percy Barsby was in his family home miles from the explosion but years later he could still recall the huge pall of grey, greenish-black smoke which descended on the village plunging it into darkness. The official death toll was 134 and up to 300 workers in the factory were injured, some of them seriously, but again, exact numbers are difficult to establish. You won`t be surprised to know that explosions in shell filing factories were far from unusual, Chilwell had nineteen documented events and two of the men commemorated on the memorial in Chetwynd Barracks did not die in 1918, but in the previous year. Again, one of the awkwardness of trying to work out casualty figures. What was distinctive about July 1st 1918 was the number of those who died. The characteristic of the National Shell Filling factories, of which Chilwell was No. 6 was they were generally built in out of town locations

List of National Shell Filling Factories

No. 1 NFF Leeds - Barnbow

Construction started: 13 September 1915. Contractor: W. Irwin and Co Ltd. Opened: March 1916. Area: 296 acres. Munitions: filling 18-pdr. to 6in shell and QF, BL type cartridges. Notes: an explosion occurred in December 1916 which resulted in the deaths of 34 women.

No. 2 NFF Liverpool - Bland Park Farm - Sefton

Construction started: 18 October 1915. Contractor: Bullen Brothers Ltd. Opened: January 1916. Area: 175 acres. Munitions: 6in HE howitzer, 18-pdr. incendiary and 60-pdr. HE shell. Notes: built close to Aintree railway station.

No. 3 NFF Perivale, London (Willesden Lane)

Construction started: 26 August 1915. Contractor: Alfred McAlpine and Sons Ltd. Opened: 1 December 1915. Area: 120 acres. Munitions: detonators, gaines and primers.

No. 4 NFF Georgetown - Erskine (Paisley)

Construction started: 25 September 1915. Contractor: Alfred McAlpine and Sons Ltd. Opened: January 1916. Area: 250 acres, agricultural land. Munitions: filling 4.5in and 18-pdr HE, 12in HE and trench mortar bombs.

No. 5 NFF Gloucester - Quedgeley - Construction started: 20 October 1915. Contractor: The Gloucester Constructionists Ltd. Opened: March 1916. Area: 308 acres, agricultural land. Management: local board of management. Munitions: filling 18-pdr. cartridge, 4.5in and 60-pdr. shell, cartridges and primers.

No. 6 NFF Chilwell - Long Eaton

Construction started: 5 September 1915. Contractor: Holland and Hannen and Cubitts Ltd. Opened: January 1916. Area: 208 acres. Munitions: TNT and ammonium nitrate filling 4.5in to 15in shell. Notes: on 1 July 1918, a serious explosion in the amatol mixing house resulted in the deaths of 134 employees.

No. 7 NFF Hayes

Construction started: 8 September 1915. Contractor: Higgs and Hill Ltd. Opened: 30 October 1915. Area: 200 acres Munitions: detonators, gaines, 18-pdr., 4.5in, 6in howitzer HE and smoke. Notes: also known as Emergency Factory No. 2

No. 8 NFF Southwark, London (Sumner Street)

Existing building with new extensions added late summer 1915. Contractor: John Gray Ltd. Opened: 12 September 1915. Area: 60,000 sq yds. Munitions: filling gaines, Nos. 100 - 103 type fuses, and inspecting protective clothing. Notes: this site was known as Emergency Factory No. 1.

No. 9 NFF Banbury

Construction started: 28 January 1916. Contractor: Holland, Hannan and Cubitts Opened: 25 April 1916. Area: 142 acres. Munitions: lyditte filling factory - H2 mines, 18-pdr., 6-pdr. and 60-pdr. HE.

No. 10 NFF Coventry - Whitmore Park / Foleshill

Construction started: 12 September 1915. Contractor: White and Poppe Ltd. Opened: September 1916. Area: 109 acres, land owned by White & Poppe Ltd. Management: White & Poppe Ltd. Munitions: filling detonators, fuses and gaines.

No. 11 NFF Abbey Wood

Construction started: 23 September 1915. Contractor: Kings Norton Metal Co. Opened: January 1916. Management: Kings Norton Metal Company. Munitions: assembling and filling shell, fuses, detonators and gaines. Notes: built adjacent to the company's works at Abbey Wood.

No. 12 NFF Cardonald - Glasgow

Construction started: 18 October 1915. Contractor: Alfred McAlpine and Sons Ltd. Opened: January 1916. Management: Nobel's Explosives Ltd. Munitions: detonators, gaines and primers. Notes: built close to Cardonald railway station.

No. 13 NFF Morecambe - White Lund

Construction started: 23 November 1915. Contractor: Mitchell Brothers Ltd. Opened: July 1916. Area: 250 acres. Management: Vickers Ltd. Munitions: filling 6in howitzer, 8in HE and 60-pdr. HE. Notes: These works were destroyed by fire and explosion in 1917

No. 14 NFF Hereford

Construction started: June 1916. Opened: November 1916 and April 1918. Area: 519 acres. Munitions: 18-pdr., chemical, 60-pdr. HE and 6in howitzer HE. Notes: closed in April 1918 and put on stand-by, reopened due to explosion at Chilwell.

No.x NFF Luton, Chaul End

Autumn 1916 Summer 1917 Products: Filling and converting fuses Managed by: George Kent Ltd.

No. x Liverpool, Aintree

First production: July 1918 Products: Filling shell up to 8-in.; filling and assembling components. Managed by Board of Management

No. 18 NFF Pembrey - Burry Port

Opened: 2 July 1915 and nationalised in June 1917. Management: Explosives Loading Co. Munitions: filling 4.5in, 6in, 8in shell and breaking down of defective shell and amatol recovery. Notes: built adjacent to HMEF Pembrey.

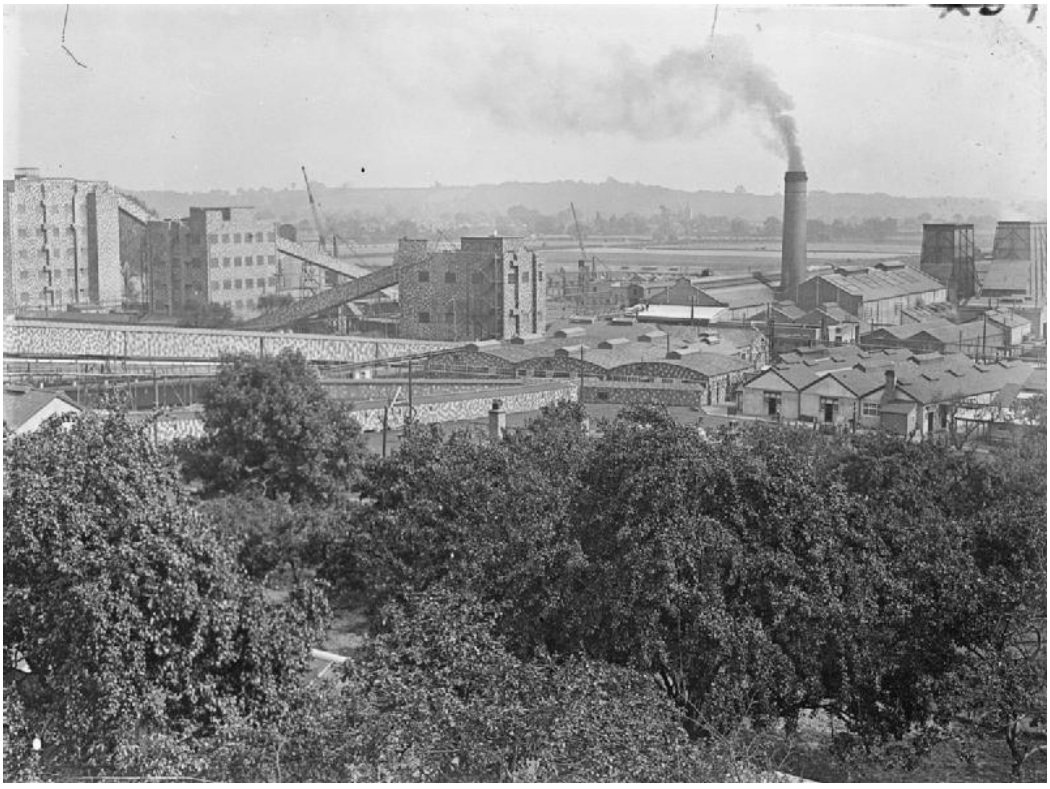
No. 22 NFF Gainsborough

Construction started: 24 November 1917. Opened: 14 February 1918. Area: 143 acres. Management: local board of management. Munitions: for filling sinkers with TNT, and naval work including H2 mines.

No. 23 NFF Chittening

Construction started: November 1917 - January 1918. Contractor: Thorburn Ltd. Opened: June 1918. Area: 200 acres. Management: Nobel's Explosives Ltd. Munitions: 6in shells filled with mustard gas.

Throughout the duration of the war information about the number of casualties at NFFs was restricted but normally it was no more than two or three who died in any single incident but the 134 fatalities at Chilwell represented around 60% of the national total. This gave the Chilwell explosion a prominence which derived from the fact that this was the largest loss of civilian life in a single incident on the Home Front during the First World War. That alone made it a subject of particular interest.



John said that he would guess that few people would remember the National Ordnance Factories at New Basford or the National Shell Factory at Lenton, never mind the National Concrete Factory near Gotham in South Nottinghamshire. None of these had an explosion, none of these, inadvertently, drew the attention of the country to them in the manner of Chilwell in July 1918.

Within the present depot a number of buildings from the Great War survive which have been adapted to new uses. The largest surviving building is the former shell store. Its floor area covered nearly 9 acres and it could hold up to 600,000 filled shells and 100,000 empty shells. No. 6 Factory was commissioned in August 1915, shell production began in the spring of 1916 and ceased on November 11th 1918. Many of the buildings were subsequently demolished but the site was retained as an army base – which it still is although it is planned for closure in 2025. Chilwell filled 19,325,959 shells in the course of its operations between 1916 and 1918 which represented 50% of all the shells filled in the numerous factories throughout the country during the same period. Even without the notoriety of the explosion, these output figures significantly enhanced Chilwell`s reputation.

John said that the remainder of his talk would focus on three strands…..

Setting up of the Factory

The Explosion

The Aftermath

With respect to the setting up of the factory, John said he expected most of his audience would know the background to this, particularly the `shell crisis` of the spring of 1915, which after many disputes and discussions, led to the creation of a Coalition Government and the setting up of the Ministry of Munitions.

DELIVERING THE GOODS.

The commanders of the BEF demanded that of the shells being supplied, they required a much higher proportion of High Explosive shells and by May 1915 the only way to achieve this was to set up new factories dedicated to the production of these munitions under the new Ministry of Munitions with David Lloyd George at its head, this being constituted by June of that year.

Very aptly shown in this `Punch` cartoon of the time. Lloyd George, of course, was very keen to let everyone know that he was going the `make things happen`

He was at the Ministry for just over one year and during that time cultivated the image of himself as `the Man Who Won the War`. It was his idea to have these dedicated munitions factories, tightly controlled by Whitehall with wages set nationwide, no strikes and other employment conditions were laid down. By the end of the war 218 of these factories had been built, all under the control of the Ministry of Munitions.

On the 18th of August 1915, Charles Ellis of the Ministry of Munitions, wrote a letter to Viscount Godfrey John Boyle Chetwynd (left) inviting him to a meeting at the Ministry.

Unlike many of the landed aristocrats, Chetwynd had trained as a civil engineer, had worked in the US and had pursued a very successful business career, including being on the Board at Vickers, a major supplier of guns and ammunition.

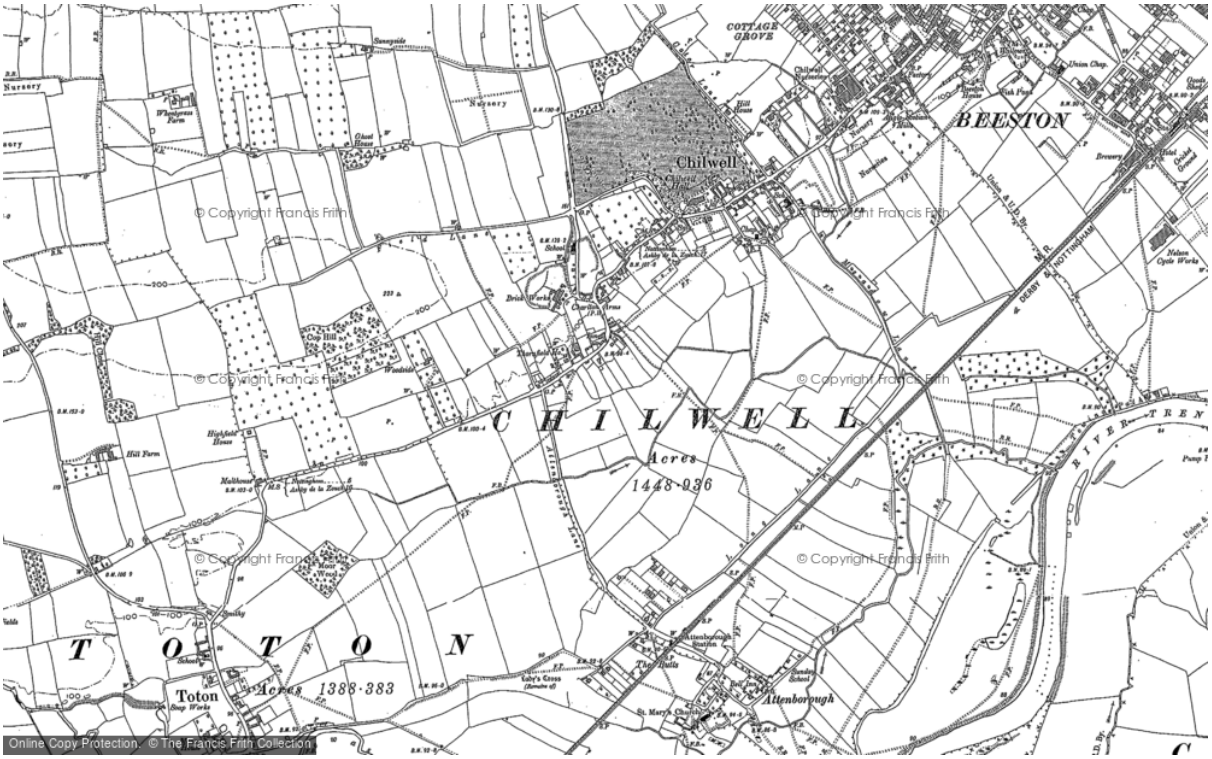
Lloyd George was determined to circumvent the ponderous ways of the Civil Service and he wanted to bring in senior industrial figures like Chetwynd to drive the National Factories programme. Chetwynd understood that the letter from the Ministry didn`t actually say `will you consider attending a meeting…what it really meant was `you will turn up at the Ministry – we wish to commission you`.

Anyway, he turned up on the 20th August 1915 when he met the senior Civil service member in the unit, Sir Frederick Black. The meeting was short and to the point with Black commissioning Chetwynd to buy the site, construct and equip a factory capable of filling high explosive 60lb shells and above at the rate of 1000 tonnes of high explosive weekly…and he was to do it…`in the shortest possible time !!

Apart from having an accountant to check his figures, Chetwynd was given virtually a free hand – and this was deliberate – Lloyd George was convinced that the Ministry needed to recruit…..”…fertile and original minds, men of real inventive and administrative ability, to harness their capabilities to the furtherance of our immense task…” And he recognised that these…. `might be men of a holy terror of red tape…”. He recalled in his memoirs that this was his fear and he wrote about Chetwynd…” he had no practical experience in dealing with explosives…..but he had a tremendous store of resource and ingenuity….and I was warned that any attempt to control him by a bridle of red tape would fail…”. The remit was to fill high explosive shells and get them to the front at as quickly as possible and he told the civil servants at the Ministry that he must have a free hand or he would not do it. He would not be constrained by managers at the Ministry and his contract was to run until after the war had ended so that at no point could his independence be doubted.

From that point onwards we find that he becomes the person who really sets the place on its way, when George Duckworth, an inspector with the Ministry of Munitions visited the factory he wrote this “…..the factory appears to be the creation of Lord Chetwynd, he told me that when he took on the job there was to be no interference with his methods so….everything was to be done according to *his* determination. Considering he knew nothing about explosives there must have been questions. So, he got on with it and within days of this meeting at the Ministry he was travelling the country, looking at methods, particularly the making of Amatol, and of course looking for his own site which turned out to be in Chilwell which he signed off the acquisition on the 29th August 1915 – nine days after he agreed to take on the job.

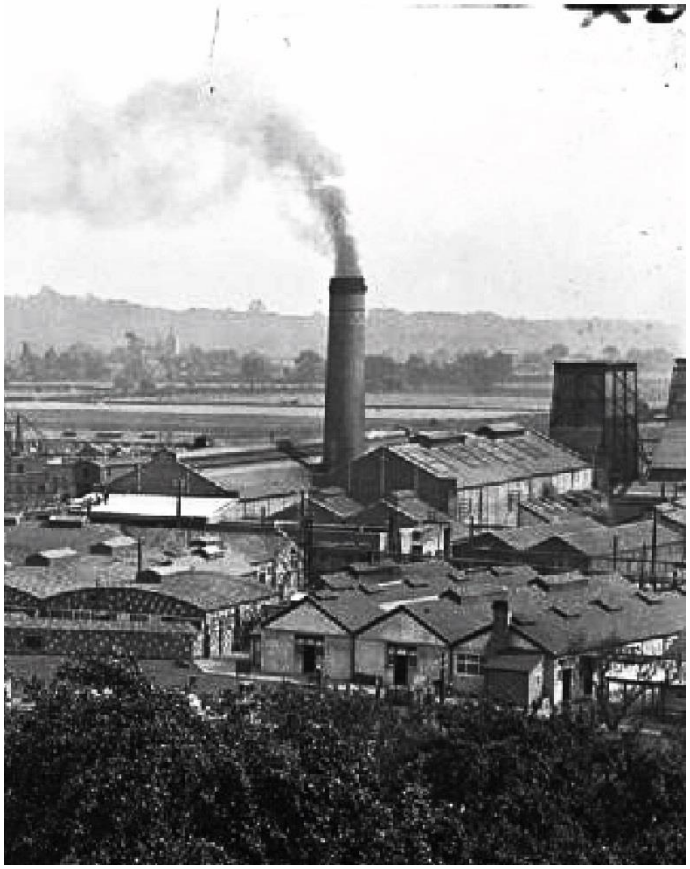
The other person who wrote about him was Edgar Wallace a journalist and thriller writer who wrote in a hagiography of Chetwynd…`the first week was spent sending out orders for power plant, engines, wagons, steel, tubes and wires….in other words he was a bundle of energy. The key thing, of course, was the site which was on green belt land but, under the terms of D.O.R.A. (Defence of the Realm Act) legislation he could more or less take what he liked.



It was about 200 acres, dived into two – north and south - by a turnpike road. Much was made of the fact that this was an ideal location to set the factory up – but John said that, in his opinion, this was complete and utter nonsense – they could not have made a more stupid decision, for to put the thing on a site split in half by a turnpike road which meant that the first thing he had to do was to get the road closed in order to widen Attenborough lane so that they could actually get in and out of this factory. Nevertheless, because he was acting on his own and nobody could challenge him, he just went ahead. Subsequently, Edgar Wallace wrote….”Chetwynd is by far the biggest man that the war has produced…if the hour has produced the man…then that man was certainly Chetwynd”.

Despite bad weather throughout the winter of 1915 -16 – which at times left the whole site a sea of mud and water –construction went forward rapidly – including lengthening the platforms at the tiny station at Attenborough to accommodate the vastly increased numbers using the station, particularly at shift turn-round time. The history of the site – brief as it was noted `the finest feat of construction was the building of the melt-house`.

The factory was fully operational just one year after Chetwynd was commissioned to build it and he got much credit for that, for undoubtedly, he was the person behind this achievement. Factories such as Chilwell were not notable for their architecture – they were functional. None of the buildings was particularly substantial, one of the reasons why, when the explosion occurred, there was so much damage.



The first shells were filled on the 8th January 1916 and the first batch was tested at Shoeburyness firing range on January 23rd and supply to the army commenced in April of that year. October 1916 saw 6000 men and women employed on the site and by the end of 1916 output was around 100,000 shells per week. Of this 6000, around 2000 were women, much against Chetwynd`s wishes.

John then moved on to the second part of his presentation – the explosion itself.

The explosion took place on July 1st 1918, according to the Home Office enquiry it took place at 7.12pm precisely

Shell filling factories were certainly dangerous places, the photos show the epicentre of the explosion, but other areas of the site were virtually unaffected although all the glass was broken.

There had been accidents before at the works, one man being killed in 1916 and a further two in October 1917. Indeed four more lost their lives in 1918, after the explosion in July, before production ceased at the Armistice.

According to Chetwynd, the centre of the explosion was the Mixing House of the Dry Process…at this point John said that he was not a chemist and had no intention of embarking on a new career at this stage of his life…so, he went on, if some of my analysis is incorrect…`please don`t throw too many stones at me…just quietly correct me later on`. John said that he had had some assistance from a professor of chemistry at the university who is an expert in explosives and continued by saying that what we know from Chetwynd`s researches as a result of time he had spent in France in October/November 1915, Chilwell had been set up to fill shells by what was called the 80/20 method in the Dry Process – Amatol 80/20* - the 20 being the percentage of TNT – the 80 balance being Ammonium Nitrate. Lloyd George was very keen on the success of this project because, if you use 20% TNT, it costs much less to manufacture the shells, without denigrating the explosive power compared with those using a higher proportion of TNT. We sometimes forget that, in Whitehall in general, Ministers in particular, the cost of things in war was of particular concern.

The explosion on July 1st occurred in the `Dry Process` and it was at that point that production of Amatol abruptly stopped by amazingly, within a few days they had restarted production and by September 1918, they were breaking all production records. How can this be, when a large part of the factory has been completely obliterated? They moved to making 60/40 Amatol (60% Ammonium nitrate/40% TNT) by the `Melt Process` as by that time there was the build up to the offensives of the `Hundred Days` and Lloyd George was more concerned with getting shells to the battlefront that costs of production. So they lose the `cheap` process of amatol 80/20 and keep the more expensive 60/40.

As soon as the explosion happened, everyone on the site knew that this was a crisis. A discharged soldier, William Spreadbury OBE now working as a telephonist, put out calls to all the emergency services, ambulances, fire brigade, police, doctors, nurses, motor cars…and even, John has been assured…wheelbarrows .

The National Ordnance Factory at New Basford, for reasons of safety and security had an ambulance brigade of ten men and women on each shift whereas Chilwell had nothing like that having only one fire engine – was that result of Chetwynd cutting corners ?

Within ten minutes of the blast 300 members of the St. John`s Ambulance were on site rendering first aid. They were later congratulated by the speed with which they arrived to begin bringing aid to those who had suffered. Other local people rushed to the site to assist. Chetwynd was not at the factory that evening, he was at Winthorpe Hall, the family home near Doncaster, in bed with influenza – one of the early victims of the first phase of the `Spanish` flu, as it became known. Despite being ill, as soon as he received a telephone call telling of the blast, he immediately drove to Chilwell and was on site by 10pm to find that the clean-up was already in full swing. Later, many of those involved in the rescue of those trapped and who were involved in the clean-up were awarded OBE`s and other civilian decorations. Chetwynd was later to record that hundreds rushed to the rescue and laboured for hours in the ruins, extinguishing the fires and succouring the injured. As he didn`t arrive until more than three hours later, much of which he wrote must have been second hand. Local boy, Percy Barsby, who we met earlier in the talk, recalled years later of hundreds of folks running down Attenborough Lane telling us to run for our lives as there was another five tons of TNT about to go `up` at any minute. The impression is given that Chetwynd and other senior figures wanted to give the impression that all had acted with calm as you would have expected but the reality was somewhat different.

Fred Spicer said he saw many people in distress, some bandaged being transported on lorries, carts, indeed anything which could get them transported to local doctors surgeries or the Nottingham hospitals. Joe Moody, then aged ten – whose Daughter still lives in Chilwell – recalled a huge cloud of smoke and debris which rose hundreds of feet into the air, people rushed out of their houses and then a continuous convoy of vehicles making its way to the hospitals in Nottingham, some with blood dripping out onto the road. Moody provided directions to a motor cyclist who had a badly injured woman on the pillion and an injured man in his sidecar. Percy Barsby witnessed a tragic sight, horses and carts, lorries and vans, moving in procession, taking the injured to hospitals in Nottingham and Lottie martin, who worked in the factory but was not on that shift later recalled "….men and women, badly burned, practically all their clothing torn and shredded, their faces black and charred, bleeding with limbs torn off, eyes and hair literally gone, dad decide it was best we make our way to the fields but the conveyances were still making their way to Nottingham…". Dorothy Bruce who lived in Nottingham said some were brought into the hospital in wheelbarrows.

The Nottingham General hospital, now no longer there of course, was the main recipient of the injured, others went to the Long Eaton VAD hospital whilst some went to Trent College which opened up its facilities to receive victims of the blast. John said that he knew, because information became available under the Hundred Year Rule last year, that 44 casualties were admitted to the Nottingham General Hospital that evening. The admissions book is somewhat anodyne about the condition of some of those admitted but the hospital board minutes were more explicit and tell us that 44 cases, most of a serious nature were admitted with at least eight dying according to entries in the register. It is highly probable that anyone recorded as dying on July 1st 1918, was likely to have already been dead.

There is one case, Charlotte Herries, 53, of Ilkeston, who was admitted with a compound fracture of the skull and died four days later.

There is no accurate figure for the numbers of people injured with injuries ranging from minor cuts and bruises to those seriously injured but who, in time, did recover. All sorts of numbers

have been offered, up to 350. The official death toll was 134 and this figure was later confirmed in the Home Office report and included 25 women working in the factory and on occasions these figures are mis-used with some assuming all the dead were women. Most of the dead had been working in the Mixing House in the Dry Powder Process Amatol 80/20, casualties in these buildings were, in the words of the Official Report were `blown to pieces`. Of course, there was no surviving witnesses in these areas to provide oral evidence as to what might have happened in the lead up to the explosion. The enquiry took evidence from those who had been on the previous shift which had finished at 6pm. Perhaps the luckiest man was John Allan Cooke, the Powder Controller, who had left the Mixing House at 7.07pm, missing the explosion by about 3 minutes.

The total of 134 fatalities was based upon the compensation claims received by the War Office and not, as has usually been claimed from the names on the War Memorial in the barracks at Chilwell. Such was the ferocity of the explosion, only 32 of those who died could be positively identified, the others pulverised beyond all recognition, the gruesome details being recorded on the Attenborough Parish Records for, of course, Chilwell was within the Parish of Attenborough. On July 4th 1918, bishop Edwin Hoskins, the Bishop of Southwell, in which diocese Attenborough lay, conducted an communal funeral service in which eleven males `names unknown` and two females `names unknown`, six persons `sex and names unknown` were buried. Fourteen coffins containing human remains which could not be identified followed.

Lottie martin recalled the funerals when she composed her memoirs years later…

“the awful cavalcade which made its way down Attenborough Lane to the strains of the Works Band playing Handel`s Dead March in Saul”

Memorials to the Unidentified in Attenborough Churchyard

A second mass funeral took place on July 6th, this time with seven coffins containing portions of human remains and two days later there was a further funeral for two of the men and other coffins containing unidentified remains. This carried on until the final commital on the 13th of July.

There is nothing in the material surviving from this time to describe the impact all of this had upon the rescuers but John`s colleague Nigel Hunt from the University`s school of Psychiatry who is an expert, particularly in post-war trauma is convinced that there would have been post-traumatic stress affecting some of the people involved in the clear up. (Note – members may recall Nigel Hunt giving an excellent talk to the Branch on `Shell Shock` a couple of years ago)

Most of the women who died were young, in their twenties with the oldest being 61 year old Annie Benton. Most of the men were older, generally in their 40s, but perhaps the saddest case was Ellen Hall, aged 27 from Ilkeston who started work in the canteen after her husband, a Sherwood Forester, was killed on the Western Front on June 17th 19177. She was the only canteen worker to be killed although several others were injured. Many bodies that were identifiable or sufficiently intact were taken by their families and all are commemorated on the Nottinghamshire roll of honour which was completed last year. Two of the women Louise Chaplin and Fanny Taylor are commemorated on the War Memorial at Gotham.

Details of the Memorial in Chetwynd barracks

Attenborough Churchyard

It will be noted that the blue plaque says the number of dead was 139, there was a bit of controversy at the time as the official figure was 134 but no doubt some died from injuries sustained in the days and weeks (months?) after the explosion and the exact figure will never be known.

Of course, all of this could not be reported because the information and the implications on the production of shells could prove useful to the enemy and so the local paper, the Beeston Gazette, had to be discrete and noted that the usual processions on the 8th of July associated with the local Wakes Holiday would not take place and the local Sunday School procession, long

associated with Wakes Monday would not be held but would take place later `under happier circumstances`. The paper `s editorial noted `the sad sight at Attenborough last Thursday` which of course referred to the first of the funerals. The only notification in the paper of the tragedy were the death notices and a little more information was given in the Derby Daily Telegraph but in general, the information had to be kept under wraps, at least until the end of the war.

There was a telegram of commiseration from the King, George V, who had himself visited the factory on December 15th 1916, and also from Winston Churchill who was by now the Minister of Munitions and who had himself visited the factory.

Churchill wrote,

"Please accept my sincere sympathy with you all in the misfortune that has overtaken your fine Factory and in the loss of valuable lives, those who have perished have died at their stations on the field of duty and those who have lost their dear ones should fortify themselves with this thought, the courage and spirit shown by all concerned both men and women command our admiration, and the decision to which you have all come to carry on without a break is worthy of the spirit which animates our soldiers in the field. I trust the injured are receiving every care."

Lieutenant Arthur Hilary Bristow, the Works Manager, was awarded the Edward Medal in 1919 in recognition of his heroism after the explosion.

Attempts to recognise the factory by awarding it a VC were not successful although informally it was known locally as the `VC Factory` for many years.

John then moved on to the final part of his talk, the aftermath.

Chetwynd was concerned with two issues once the initial clearance had taken place, the first being to restart production as soon as possible, the second to find out why the explosion had taken place. He could not restart production in that part of the factory which had been destroyed, nor could he just carry on as before when it was still unclear as to what had caused such a catastrophe.

His immediate response was one of bewilderment…he wrote...`the cause of this explosion must be sabotage….we have produced over 50000 tons of this material and to have an explosion of this magnitude must have been due to some foreign elements introduced into the TNT we were using, possibly in transit..`. This quotation introduces the conspiracy theory, something which has never really gone away, indeed it was mentioned again as recently as April of last year in the House of Commons by local MP Anna Soubry. It is not in fact true. The Official Enquiry called by the Home Office noted that the Mixing House and its extension were completely destroyed but the agent TNT Mill building, which, although damaged, had not been demolished, nor indeed had surrounding buildings. Oral evidence was given to the enquiry team to establish who had died and where. It is possible there was actually a shortage of people that night, there were fewer people in the factory than there should have been, due, as one employee put it...`due to influenza`

The mixing house for the dry process was probably the most dangerous place on the site as it was here that the ammonium nitrate and the TNT were blended to form the 80/20 Amatol before being passed to the Press House before being pressed into the shell cases.

The explosion showed that much of Chetwynd`s thinking was wrong, mixing had been going on for a long time but the key thing was that after the explosion, there was no fire. There was a

fire appliance on site as it had been thought, initially at least, that should there be an explosion, there would be a fire? There was no fire and this messed up the thinking quite badly. Apart from broken glass and superficial damage to buildings away from the Mixing House, there was little significant damage. The Mixing house was wiped out and the Power House and Boiler House were also substantially damaged. Chetwynd asked the Ministry of Munitions to requisition all available glass in the area as all the properties in a wide area around the plant had had all their windows shattered.

So what did cause the explosion, and what was the likelihood of a recurrence?

The first thing that Chetwynd did was to contact the Chief Constable of Nottinghamshire to arrange for an Inspector to come from Scotland Yard to take witness statements. These were subsequently part of a Commission of Enquiry set up by the Home Office. Chetwynd told Cornish, who was setting up this enquiry, that he was convinced that it was sabotage and indeed was said to have named a possible culprit. Whether this was in fact Chetwynd`s genuine feelings or was he conforming to the instructions of a War Office Standing Committee of January 1916 which instructed all munitions factories to inform them of any act, or suspected act of sabotage which had taken place.

Cornish took 40 witness statements – all from *male* employees. Chetwynd also wrote his own account of what happened and he concluded that the cause of the explosion was`obscure` and that no evidence of sabotage or foul play would be found unless the guilty party makes an admission. Of course the reason for this is simple – no one who could have shed light on this was still alive.

Inspectors arrived at Chilwell on June 8th 1918 and looked at what was to be found, subsequently returning to London and producing a report on August 7th, classified as `secret`and it is probable that Chetwynd himself never actually saw this report. There was certainly mixed feelings expressed about Chetwynd, accepting that there was no obvious weaknesses, ruling out sabotage but they did agree that there was all sorts of ways in which things could have been done better, the most obvious one being that there was too many people working in the same, very dangerous space and this situation should not have been allowed to happen.

The consensus, including that from many people working on the site was that a piece of metal had fallen off a conveyor into the mixer.

Various other people had their own views as to what had happened and gave those freely to the enquiry. Was it malicious? The enquiry thought not, they accepting the theory that a piece of metal had fallen into one of the mixing machines. The report concluded that the initial detonation occurred without warning and this communicated instantly to the rest of the explosives in the mixing house. That is all well and good – but was that what actually happened – and here John said that he had discussed this with one of his colleagues at the University whose work includes explosives and he is of the opinion that there was actually three linked reasons and that these could not have been readily recognised or indeed understood at the time.

The first reason he suggested was that the workforce was under pressure to produce huge numbers of shells, it was coming up to the offensives of the summer of 1918, the pressure was on to produce as many shells as possible, as quickly as possible. The factory was working 24 hours per day, seven days a week on three shifts per day and on 15th June 1918 it broke all previous records for the number of shells filled and it continued to break those records in the days that followed. 10000 people worked at Chilwell at this time, many of them on piece-work

and it was a competitive atmosphere which was likely to lead to their being temptations to cut corners.

The second suggestion was the heat, all reports tell us it was a hot sultry day and witnesses said that ice was brought in to try to keep the TNT cool 55.25.

Thirdly, that something happened when the amatol was being moved to the Press House.

There is every reason to conclude that it was human error was the likely cause of the explosion, as much as any other, although there is nothing to suggest individual responsibility, that someone had done something wrong.

From John`s discussion with the chemical engineer, Professor Peter Licence, the conclusion is that the explosion occurred because of a series of `small events`, like dominoes stood up in a row, when the first domino is hit, the rest tip over one after another until a critical point is reached. In the case of high explosives this happens very quickly.

To conclude, John said that the shell requirement was such in the summer of 1918 that any interruption of supply was considered to have serious implications for the artillery on the Western Front. Astonishingly, despite the ferocity of the explosion at Chilwell, production resumed on July 5th and by September new output records were being achieved. Because of this accident, one system had to be abandoned the Amatol 80/20 Dry Process.

Chetwynd had admitted in 1915 that he knew nothing about explosives, particularly Amatol, he visited France where he learned various methods of improving output and he had subsequently changed the factory layout to make sure that it was as effective as possible. The original plan was for Chilwell to produce only 80/20 Amatol and that part of the factory was obliterated on July 1st 1918 and it was not resumed and when production restarted in was of the 60/40 Melt Process, more expensive but given the circumstances of the time considered worth it.

Another statistic – the kitchens were churning out 30,000 meals per day.

With the Armistice on 11th November the war ended and the need for shells disappeared overnight. During its time of operations Chilwell filled over 19 million shells plus sea mines and large bombs for the air force.

In a speech immediately after the war Chetwynd said…`the factory was built to help win the war…it is now ended…anyone who has a job to go to can leave immediately. Lottie Martin returned to work on November 12th knowing full well she would shortly be seeking new employment which she found in the lace trade. Indeed the Ministry of Munitions itself only lasted until 1921.

Loose ends had to be tied up and a Thanksgiving Service was held on the 15th November with the Bishop of Southwell officiating. On December 1st there was an `Open Day` when people were allowed in to see around the site – when Chetwynd actually charged admission money…as John said - very ungracious!

The Duke of Portland unveiled the memorial which is still there today on the site of the Melt house.

John finished on a rather sad note – Jane Elliston was someone who worked the factory and died in the explosion and two years later her daughters were accused of stealing some clothes pegs and were said to have been `out of control` since their mother had died. Despite the circumstances they were put on probation for three years.

To Chetwynd these were `collateral damage` and in his final report he chose to speak of the factory`s achievements rather than the loss of life. That was his priority.

Thus ended John`s excellent talk and as is customary we had a question and answer session with John fielding some interesting questions from our members before Branch Chair Tony Bolton wound up the proceedings with a vote of Thanks to John to which the members responded appropriately.

The Chilwell Memorial today

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Amatol

Amatol is a highly explosive material made from a mixture of TNT and ammonium nitrate.[1] The British name originates from the words ammonium and toluene (an ingredient of TNT). Similar mixtures (1 part dinitronaphthalene and 7 parts ammonium nitrate) were known as **Schneiderite** in France. Amatol was used extensively during World War I and World War II, typically as an explosive in military weapons such as aircraft bombs, shells, depth charges, and naval mines.[2] It was eventually replaced with alternative explosives such as composition B, torpex, and tritonal. Amatol exploits synergy between TNT and ammonium nitrate. TNT has higher explosive velocity and brisance, but is deficient in oxygen. Oxygen deficiency causes black smoke residue[3] from a pure TNT explosion. The oxygen surplus of ammonium nitrate increases the energy release of TNT during detonation. Depending on the ratio of ingredients used, amatol leaves a residue of white or grey smoke after detonation. Amatol has a lower explosive velocity and correspondingly lower brisance than TNT but is cheaper because of the lower cost of ammonium nitrate. Amatol allowed supplies of TNT to be expanded considerably, with little reduction in the destructive power of the final product, so long as the amount of TNT in the mixture did not fall below 60%. Mixtures containing as little as 20% TNT were for less demanding uses. TNT is 50% deficient in oxygen. Amatol is oxygen balanced and is therefore more effective than pure TNT when exploding underground or underwater. Relatively unsophisticated cannery equipment can be adapted to amatol production. TNT is gently heated with steam or hot water until it melts, acquiring the physical characteristics of a syrup. Then the correct weight ratio of powdered ammonium nitrate is added and mixed in. Whilst this mixture is still in a molten state, it is poured into empty bomb casings and allowed to cool and solidify. The lowest grades of amatol could not be produced by casting molten TNT. Instead, flaked TNT was thoroughly mixed with powdered ammonium nitrate and then compressed or extruded.Amatol ranges from off-white to slightly yellow or pinkish brown depending on the mixture used, and remains soft for long periods of storage. It is hygroscopic, which complicates long-term storage.[4] To prevent moisture problems, amatol charges were coated with a thin layer of pure molten TNT or alternatively bitumen. Long-term storage was rare during wars because munitions charged with amatol were generally used soon after manufacture. Amatol should not be stored in containers made from copper or brass, as it can form unstable compounds sensitive to vibration.[4] Pressed, it is relatively insensitive but may be detonated by severe impact, whereas when cast, it is extremely insensitive. Primary explosives such as mercury fulminate were often used as a detonator, in combination with an explosive booster charge such as tetryl. The explosive charges hidden in HMS *Campbeltown* during the St. Nazaire Raid of 1942 contained amatol. The British X class midget submarines which planted explosive charges beneath the German battleship *Tirpitz* in September 1943 carried two "saddle charges" containing four tons of amatol. Warheads for the German V-1 flying bomb and V-2 rockets also contained amatol. A derivative of amatol is amatex, consisting of 51% ammonium nitrate, 40% TNT, and 9% RDX(which also has a negative oxygen balance.) Amatol is rare today, except in legacy munitions or unexploded ordnance. **Ammonite**, a form of amatol, is a civil engineering explosive popular in Eastern Europe and China. Generally comprising a 20/80 mixture of TNT and ammonium nitrate it is typically used for quarrying or mining. Because the proportion of TNT is significantly lower than in its military counterpart, ammonite has much less destructive power. In general, a 30 kilogram charge of ammonite is roughly equivalent to 20 kilograms of TNT.

Third Battle of Cambrai ?

Tony, as Branch Chair, and myself, received this e mail (below)from Philippe Gorczynski. M. Gorczynski who lives in Flesquieres near Cambrai in Northern France located the remains of a WW1 tank – D51 `Deborah` in one of his fields a number of years ago. With help from the Royal Tank Corps the tank was extracted from where it laid lain buried since the Battle of Cambrai in 1917 and taken to his barn in the village where it was cleaned up and placed on a plinth. Several years ago I wrote to Philippe and he agreed to meet my wife and I and let us visit the tank (and see the other battlefield artifacts which he had collected) in his barn. In 2018 a new museum commemorating the battle was opened and Philippe handed over `Deborah` to become centrepiece of this new centre for commemoration of Cambrai 1917.

Philippe Gorczynski in front to the mark IV tank D51 `Deborah` when it was in his barn

I think most of us understand that from time to time there needs to be developments at or near battlefields of The Great War, indeed that was the whole point of the war to let people live their lives as they wanted to , making local decisions. Generally work of this nature has been carried out with great sensitivity but sadly, from Philippe`s letter, it appears that the current developments are proving very much the exception.

At Philippe Gorczynski explains…

Dear Monsieur Bolton,

I think you could be interested by the action my friends and I have engaged here in France against ***some*** *wind turbines farms companies. Their number is increasing amazingly. This particular action can warned those who have future projects.*

The document attached here is the consequence of a serious matter which will affect forever a region and more particularly the WW1 Cambrai battlefield causing great concern to all those in

the world who have for the last 102 years fought hard to treasure and remember the sacrifice made for freedom and peace.

In this case, here, the project is led by Canadian investors.

We are seeing those 102 years simply pushed aside with no respect whatsoever for the blood spilt on the battlefield.

I can assure you that I have written from the heart despite the subject causing it to be rather a heavy heart.

Best regards

Philippe Gorczynski

In Flanders fields the poppies grow
Between the crosses row on row,
That mark our place; and in the sky
The larks, still bravely singing, fly
Scarce heard amid the guns below.

We are the dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved and now we lie
In Flanders fields.

Take up our quarrel with the foe:
To you from failing hands we throw
The torch; be yours to hold it high.
If ye break faith with us who die
We shall not sleep, though poppies grow
In Flanders fields.

John McCrae

Wind Turbines 2019/2020 :

No care of WW1 & WW2 archaeology, No care of History, No care of Memory, also when there are built by Canadians investors!

Even the directional poles of the Commonwealth War Graves Commission are pierced without any scruples to rivet the signage of the Canadian's wind turbines.

Ready for ACTION!!!!

L'Orival Wood British cemetery. In that cemetery Rest in Peace Ewart Alan Mackintosh. His poetry hasn't stop green's (!) investors to erect wind turbines.

The conclusion of the French man in charge of the public enquiry: The cemeteries belongs to the past, the wind turbines to the future!!!!

WW2: James Fielden LAMBERT, Squadron Leader 421 Red Bellicum Winnipeg Manitoba

KIA 20th December 1943.

The cranes dug trenches on the site of his crash, which still contains remains of the plane without care. This was to bury cables for Canadian's wind turbines.

Fields of Death, Fields of Memory, Fields of Liberty but now Fields of Wind farms. Doesn't matter the history.

In 1918, Canadians Army chose Bourlon wood (in the distance) to establish a monument dedicated to their glorious soldiers. In 2019, a Canadian company hasn't show the same careful attention where the children of Canada has fought so bravely .

13: Is it a lucky number? This is the last of the 13 machines which were part of the investors program. The hundreds tons of concrete have been poured on that spot since Tuesday the 7th of May.

When the Winds of Oblivion Blows on the Fields of Remembrance

While Canadians celebrated with dignity the Centenary of the 1914-1918 war, World War I, where Canadian troops showed such bravery, the Canadian company BORALEX (specialists in erecting wind turbines), completely ignored their sacrifices and failed to respect these soldiers honoured place in history. Our honouring of the Centennial was barely completed before the historical sites and memorial landscapes of the First World War sites near Cambrai, France, have become subject to these lobbyist's intent to establish forests of wind turbines.

It is a monumental historical and archaeological disaster that today's society will be held responsible for in this unfortunately legal destruction of our region. No precautions or any consideration has been taken to preserve the history and the traces of the human tragedy that has forever marked the Cambrésis region.

The landscapes and the subsoil had up until now, suffered very little from industrial intervention or any other major changes to the environment. Even when the two motor highways (A2 and A26) were constructed, there had not been the level of destruction as we see now with this current development. This is occurring now at a time when the battlefields of Cambrai have become internationally and world-recognized landscapes of historical memory in Europe, in much the same way as the Battlefield of Waterloo.

The French region of Cambrésis had particularly suffered during two events: The Battle of Cambrai of 1917, one of the most prominent battles in history with the first use and triumph of tanks, and that of the Canal du Nord, where the courage, determination and sacrifice of the Canadian soldiers showed the world that their country had become a great Nation. The numerous military cemeteries that mark their advance through the war are like the footprints of a giant who walked towards victory.

Today, the utter indifference of BORALEX allows the wind turbine investors to demolish and destroy forever the appearance of our sacred lands and territory. The situation is all the more dramatic, as these companies have been made aware of this history. The impact is there are

hundreds of current on-going earthworks in several thousand square meters, including the hundreds of kilometres of trenches for the wiring of wind turbines, and the widening, dismantling, and/or the construction of roads and paths for the installation of machinery. The cranes, the diggers, the bulldozers, the trucks are all clearing away and destroying the historical traces of the four years of occupation and bloody fighting of World War I.

The French authorities had already been alerted to this with the Flesquières wind farm but it did not interfere in the project. The findings of the investigating commissioners had been clear. The military cemeteries belonged to the past and wind turbines belong to the future. The financial difficulties of the villages and the financial pay-offs to the individual owners of the fields where these windmills are being built upon, overcame any consideration of any other inhabitant of the region, resigning the other 95% of the population to live with the visual blight, the disturbing noise, the death of birds, in some cases, medical problems living with flashing lights near homes 24/7 and finally the ransacking of the archaeological and historical First World War sites

The establishment of wind turbines in the Cambrésis by the State unfortunately did not respect the historical interest in the battlefield.

More serious and also unacceptable, unlike what happens in the Somme, or in Bullecourt in Pas-de-Calais, NO ARCHAEOLOGICAL ANALYSIS has been imposed on the sector of Ribécourt, Havrincourt, Flesquieres, Cantaing, Metz in Couture, Gouzeaucourt, Beaucamp, etc., i.e., the entire battlefield of Cambrai! It is unconscionable to not respect the historical importance of these battlefields. Yet the blood of our allies, with more than 20,000 dead, was not respected! During excavations for the future canal Seine Nord, archaeologists were available for many, many kilometres to remove vestiges of Gallo-Roman settlements. Here nothing has been done and no archaeological concerns have been engaged.

No archaeological department is visible, nor interested. They are absent to witness the destruction of the archaeology they are tasked with saving! All chances of recovering artefacts, tracking, or inventory were lost as these items of the war are now left to the goodwill of companies with no particular sensitivity to the history of our region.

For more than thirty years, members of the Flesquières Tank Association have been committed to collecting, saving, and preserving a ‘heritage in danger’ because it was very often forgotten and many times neglected. Its members pledged to collect the memory and artefacts from the elder residents of the region; to provide an inventory of the surviving concrete buildings of the Hindenburg line, but also the evidence of the individual conflicts within the battles or traces of the occupation that are still present in the villages and the countryside. The recovery and preservation of those important remains of the battles are our priority.

We had hoped that the BORALEX Company would have paid respectful attention to these important places of historical significance and memory as we honour our history and those people that fought and died here. Our attempts to notify them of our very critical concerns have been unsuccessful. Our recommendations have not been taken into account. No compromises or alternatives have been relayed. The leaders of BORALEX acted in full knowledge that their development was on an important battlefield and on a place of historical remembrance. That they were aware of this is evidenced in their recognition that they were responsible in the event of an accident; which is quite commendable. BORALEX requested a company of pyrotechnic experts (gas shells, explosives, ammunition) to extract, on a large scale, all dangerous relics on the many sites where the workers were exposed to that danger.

For several months, a specialized company, hired by BORALEX, with a large staff and the help of many cranes, worked in the south of the Cambrésis in the heart of the battlefield. Aware of the dangers of the work, we did not seek to interfere with their progress. Many shells and ammunition were extracted, and then disposed of by the official department. But we were shocked to find that also a considerable amount of personal and professional material belonging to WW1 soldiers was abandoned at the edges of the paths or at the corners of the fields to finally be picked up by scrapers or simply looted. For proof and our extreme concern, we found that the piece of a tank was found abandoned on the edge of a field track!

Also, at the beginning of April 2019, once again, we were moved and dismayed to see the Boralex cranes dig trenches, without any precaution, on another historical site but this time of the Second World War.

(On December 20, 1943, James Fielden LAMBERT of WINNIPEG, MANITOBA, was the RAF's Squadron Leader of 421 Red Bellicum. The mission of the Spitfires' group was to protect American bombers going to destroy German's V1 and V2 bases in Holland. His plane was attacked and hit by enemy fighter planes and crashed near the village of Marcoing at the very spot where the electric cables connecting the 4 wind turbines between Bourlon and Marcoing were buried. James Fielden Lambert was killed. He rest in peace at the Cambrai east Military cemetery. Traces of this tragedy are still slightly buried on the crash site. As proof, some time ago, objects belonging to the pilot were found and were saved!) This time, Boralex cranes went through the site in a total indifference!!!

BORALEX had no obligation to do otherwise- since no special archaeological concern was imposed upon the issuance of the permits. The Canadian origin of the group gave us hope that particular attention would have been paid to our sector. There was nothing and yet investors did not choose to name the company underwriting the project "The Winds of the Cambrésis"! These winds only blow in the direction of investors, finance and lobbyists.

However, we asked, as historians and archaeologists do, for inventories and photographic surveys of the discoveries of work be carried out. There is no response from the company's communication department, which only tells us that ‘we would be notified if there were any important discoveries’.

Having no competence, how could they judge importance in terms of memories, physical items of interest to historians, and the inherent significance of these items? This is evidenced by the fact that we have never been informed of any discoveries. We have explained that our members of the association have a perfect knowledge of the battlefield.

An unacceptable response from the communication department came to us confirming the complete lack of interest shown by BORALEX. Our proposal has therefore remained unused, and the BORALEX Company has confirmed its lack of historical and humanitarian consideration in the work it has carried out, and which it still carries out in the Cambresis.

Could this be different? Yes we propose that we have already been involved in a better way forward.

By irony of history on the North side of the Flesquières ridge, six wind turbines have just been erected. The company in charge was Austrian.

Spontaneously, the directors of this company immediately understood the historical interest of the site, and also demonstrated a historical respect to the land. Everything we asked for above

was granted and we have been advised of many important and interesting discoveries. One of our members was allowed to document all of the operations.

The Austrian company also technically supported the construction of the interpretation Centre "Cambrai Tank 1917 ". While this company was not obliged to do so, the same company voluntarily restored the surroundings of the two British military cemeteries of the village. What a difference compared to BORALEX.

In Bullecourt, where the Australians fought with such bravery, the Company's directors, under the demand of the Australian Government decided to annul the installation of the wind turbine project.

Archaeological digs are programmed every year by a British association of ex-military men. Each metre square of their digging is scrupulously controlled and studied. What is discovered is cleaned, indexed, photographed and preserved to testify to the memory and of the historical reality of the men who fought.

On the crest near the village of Flesquières, in 1997 our association erected and inaugurated with a lot of effort and passion, a monument: "The Monument of the Nations" that features the flags of the nations that fought on this battlefield. The Canadian's flag flutters proudly adjacent to the others, but soon the wind turbines will put it in the dark shade!

The site is a vantage point where thousands of visitors come to discover the Cambrai battlefield. We have set up an orientation table to allow the reading of the landscape and the interpretation of the history.

We have also informed BORALEX of the nuisance and visual pollution that their machines will cause to our site, as they will be erected in front, but there is no consideration, nor even any mention of a compromise.

For the Fields of the Battle of Cambrai, the situation is now hopeless. It was with deep sadness that we want to inform the many visitors and passionate aficionados of this historic rampage.

The company of "Cambresis winds" will remain for history as a devastating tornado.

However, we chose not to abandon our fight against these new invaders. New projects are already under study and we will be extremely vigilant and active.

"Take up our quarrel with the foe: To you from failing hands we throw The torch; be yours to hold it high. If ye break faith with us who die We shall not sleep, though poppies grow In Flanders fields." John McCrae

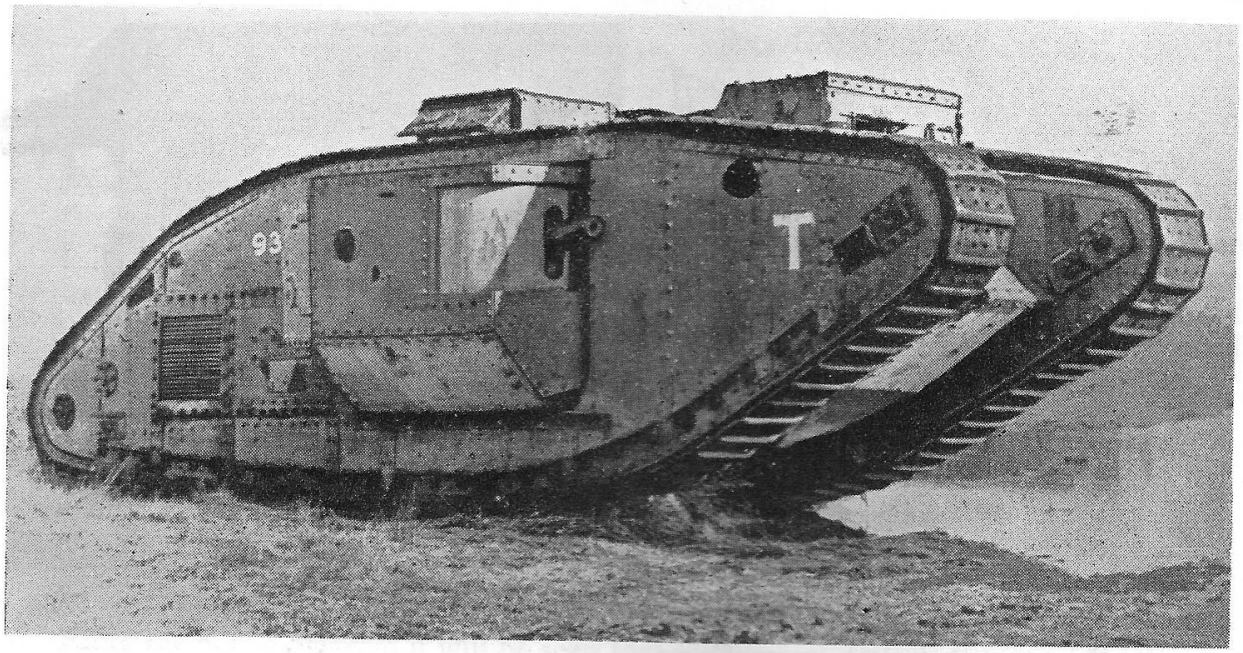
We are now looking for any help and advice that you may be able to give us or suggest where that advice and help could be found. Please contact us either through "The friends of Deborah" (contact@tank-cambrai.com) and we will be more than happy if you join our ranks in the 'Third Battle of Cambrai' that is being fought 'Lest We Forget'. The friends of Deborah conducted the 101st remembrance ceremony of the Battle of Cambrai 1917 in November 2018 and we were honoured to do this in our new century of remembrance.

Philippe Gorczynski MBE (Chairman Association Tank of Flesquieres, French Branch)
tel 0033 (0)614300165

Tim Heap (Chairman of the Friends of Tank Deborah D51, UK Branch)

British Heavy Tanks – part2

MARK V



Further experience led to the development of the Mark V tank, the most important improvement being that the tank could now be controlled by one man. The secondary gearboxes were replaced by epicyclic units under the control of the driver. Other modifications included increased engine power, and a four-speed gearbox.

The machine was a great improvement on its predecessors. The Commander was no longer hampered by the need to attend to the brakes, and the two gearsmen became full-time gunners. The new engine not merely gave increased power and better manoeuvrability, but, having been specially designed for the job, was a vast improvement from both the maintenance and reliability point of view. It was fitted with poppet valves, which necessitated retraining the crews in the maintenance of this type of valve gear, with which they were unacquainted.

The unditching gear could be fixed whilst under cover from the rear flaps of the hull (although in practice, mud made this a matter of luck). Observation was better, the rear turret having been designed as a proper fighting chamber. The doors were improved, and chutes opened outward to give better track cleaning. The stowage plan was designed to meet service requirements. A machine-gun was fitted in the rear plate, as the differential casing was now considerably smaller.

Ventilation, owing to the fact that the radiator was fitted inside the tank, was considerably worse than on previous models. In all these early tanks the crews suffered considerably from the effects of fumes and carbon monoxide poisoning, particularly after long approach marches. The effects were more marked in the case of infantry carried in tanks as they were unused to conditions inside the vehicles.

MARK V

In action, visibility was restricted to the commander's periscope and to the limited view offered by the minute peep-holes in the visor plates. If fire was at all heavy the periscope was soon put out of action.

This limitation of view made the crew almost entirely dependent upon their maps, the tank compass and upon preliminary ground reconnaissance. Each individual tank route had to be carefully planned. This planning became so well developed that the infantry came to rely almost entirely upon their accompanying tanks for direction.

The Mark V was designed in October, 1917, and altogether 400 (200 male, 200 female) were produced by the end of the war. They fought at Hamel, Moreuil, Amiens, Bapaume, 2nd Arras, Ephy, 2nd Cambrai, Selle and Maubeuge. The Museum exhibit was originally held on the establishment of the 4th Battalion, Royal Tank Corps. It carries the 'Chinese Eye' on its horns, which was the sign of that Battalion.

SPECIFICATION

General

Weight (fully stowed)	Male	29 tons
	Female	28 tons
Overall length		26 ft. 5 ins.
Overall Width	Male	13 ft. 6 ins.
	Female	10 ft. 6 ins.
Width for conveyance by rail		
$20\frac{1}{2}$ ins. shoes		8 ft. $8\frac{1}{2}$ ins.
$26\frac{1}{2}$ ins. shoes		9 ft. 0 ins.
Overall height		8 ft. $8\frac{1}{4}$ ins.
Ground clearance		1 ft. $4\frac{5}{8}$ ins.
Armour		
Maximum		14 mm.
Minimum		6 mm.
Petrol capacity		93 gals.

Engine

Ricardo 6-cylinder 150 h.p.

Crew

Eight: Commander
Driver,
6 Gunners.

Performance

Maximum vertical obstacle	4 ft. 6 ins.
Maximum width of trench crossed	10 ft. 0 ins.
Road speed	4.6 m.p.h.
Radius of action	45 miles

Armament

	Male	Female
6-pr. 23 calibre QF Hotchkiss gun	2	—
Hotchkiss machine-gun	4	6

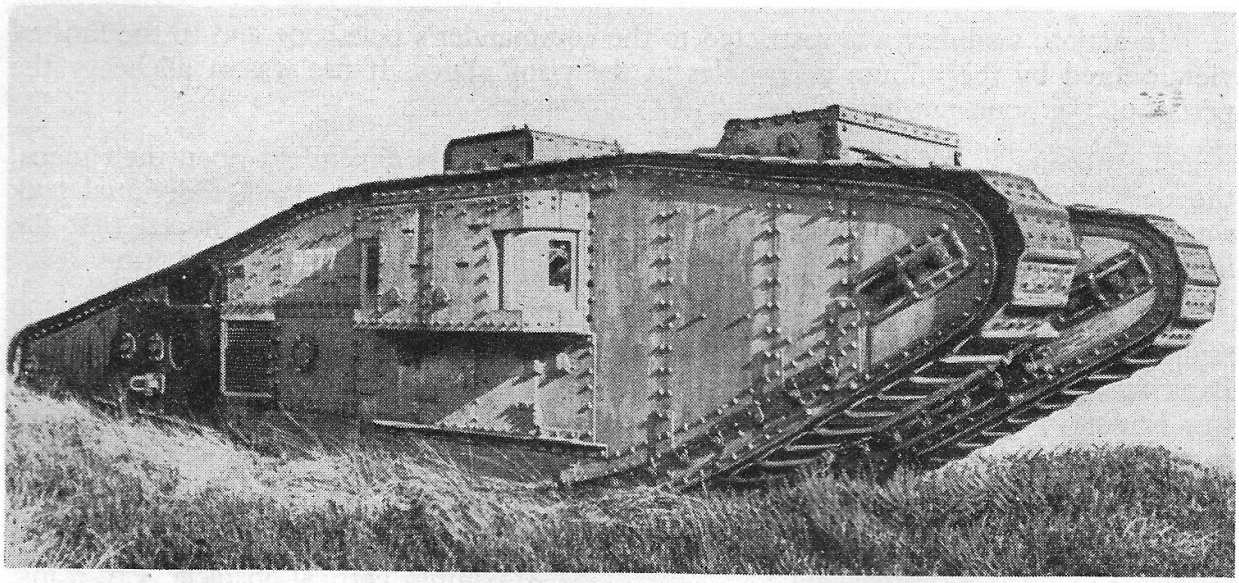
Ammunition

6-pr. shell	183	—
6-pr. case shot	24	—
Small arms ammunition	5700	14100

Signalling

Inside tank	Voice tube.
Tank to other troops	Collapsible semaphore, Pigeon.
Other troops to tank	Bell which could be pulled from outside.

DEVELOPMENTS OF THE MARK IV and V



MARK IV TADPOLE

During the 1914-18 war trench-crossing capacity was a vital factor in tank design. 'Mother' and all its successors up to the Mark V could cross a ten-foot trench, but this was found insufficient for the prevailing static trench-warfare conditions in France.

The problem was first solved by equipping tanks with large brushwood fascines, carried on top of the hull, which could be dropped into a trench before crossing. An alternative was the crib, a wooden frame strengthened with angle iron and used in the same way. A picture of tanks carrying cribs will be found on a later page.

The use of fascines and cribs had severe limitations, as obviously they could only be used once. When several wide obstacles had to be crossed during an advance a very complicated plan was necessary to ensure that sufficient fascines were available at each crossing. Even so, they proved extremely useful, and the success of the first Battle of Cambrai in November, 1917, was largely due to this device.

Experiments to increase the trench-crossing capacity of the tanks themselves were carried out on an extensive scale towards the end of 1917. The first result was the Tadpole Tail, a device consisting of a pair of mild steel rear horns complete with extension to the chain drive, which could easily be attached to the existing hull.

A tail nine feet long increased the trench crossing capacity of the Marks IV and V to fourteen feet. The device was, however, not very successful. Manoeuvrability was seriously reduced and the extension proved too weak in service.

DEVELOPMENTS OF THE MARK IV and V

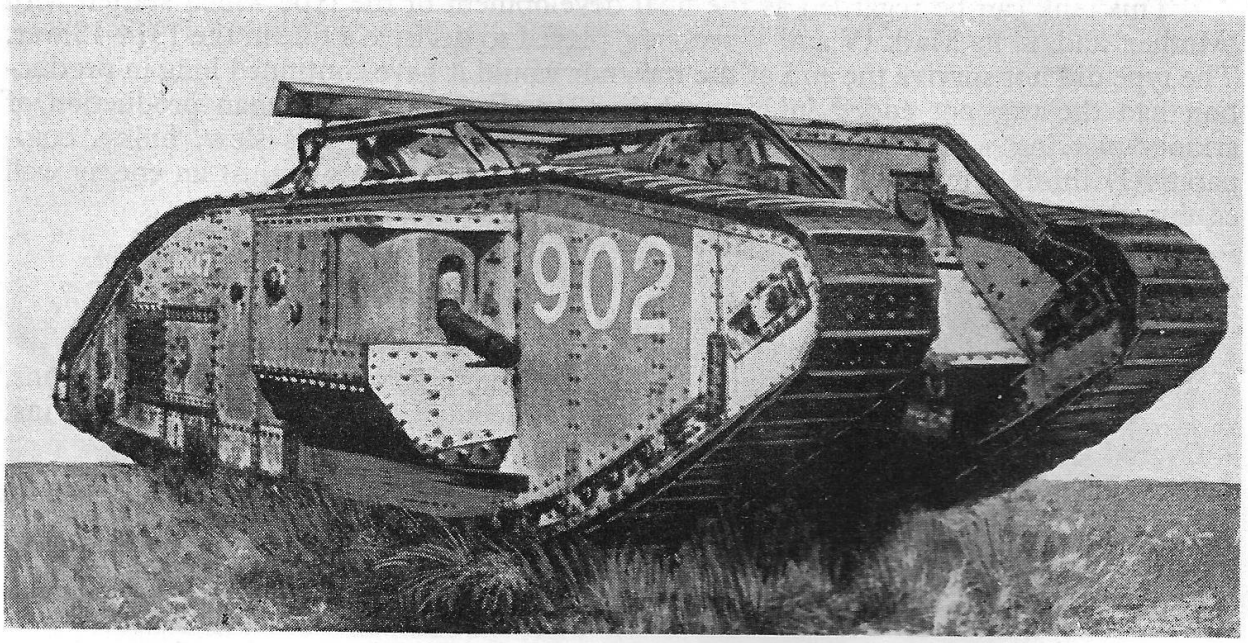
The next step towards a solution to the problem was taken at the Tank Corps Central Workshops in France, which were a vast engineering works covering 20 acres of ground. Here all badly crippled and burnt-out tanks, damaged engines and broken transmission parts, etc., were repaired. In fact, all repair work was carried out exclusively in these shops, so that the overworked factories in England were free to devote their entire energies to the production of new machines and spare parts.

In February, 1918, the Central Workshops produced an adapted Mark V lengthened by the insertion of three extra panels on either side of the hull immediately behind the sponson opening. This increased the length to 32 ft. 5 ins., and gave a trench-crossing capacity of thirteen feet. The mechanical arrangement corresponded to the Mark V except for the addition of a carden shaft between the flywheel and gearbox, which was necessary owing to the increased length.

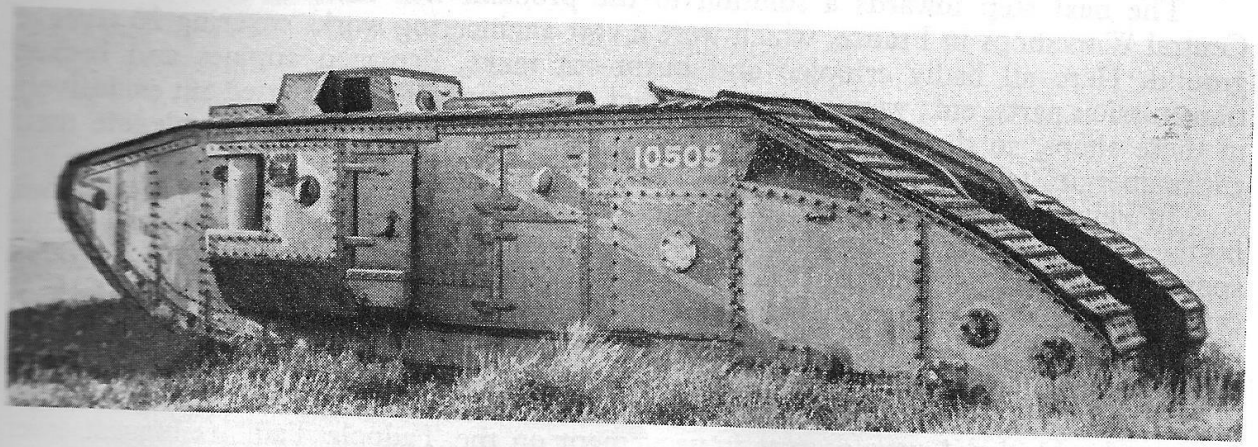
Although slightly less manoeuvrable than the Mark V, this new design, which became the Mark V*, was a great improvement on the Tadpole Tail. Its biggest asset was that Mark V* tanks could be produced quickly from existing materials which were plentiful.

The tank was soon in production, 200 male and 432 female machines being built by the end of the war. The weight of both male and female models was increased from the original Mark V by five tons. Some extra small arms ammunition was carried, but the machine was also capable of carrying 20 to 25 troops. An extra door was provided on each side in the new panels.

MARK V*



MARK V**



In May, 1918, Major Wilson redesigned the Mark V*, the new tank being designated the Mark V**. Although 300 were ordered, the machine exhibited was the only one to be completed. On trials in December, 1918, it was a complete success.

The length and width were the same as the Mark V*, but the contour was altered, the flat in the centre being reduced to six feet, and the rise forward made fuller. The engine was placed further back so that the central fighting chamber was in front of the engine instead of behind it. A larger Ricardo engine was fitted, giving increased speed and manoeuvrability.

This tank can be regarded as the final development of the type which started with 'Mother' and, in its Mark IV and V versions, played so decisive a role in the 1914-18 war. The type did not survive the end of the war, nor would it have continued long in production had the war not ended in November, 1918. For already German production of armour-piercing weapons was beginning on a big scale, and this slow, bulky, comparatively thinly armoured type of tank would have been useless against an enemy well equipped with effective anti-tank weapons.

The main points of difference from the Mark V specification are listed below.

SPECIFICATION

Weight	...	Male	35 tons
		Female	34 tons
Overall length		...	32 ft. 5 ins.
Overall height		...	8ft. 11¾ins.

Engine: Ricardo 6-cylinder
225 h.p. at 1,200 r.p.m.

Maximum vertical obstacle		4 ft. 3 ins.
Maximum trench crossed		13 ft. 0 ins.
Road speed:		
at 1,200 r.p.m.	...	5.2 m.p.h.
at 1,600 r.p.m. (governor cut out) ...	...	6.9 m.p.h.
Radius of action	...	67 miles

MARK VI and VII

MARK VI

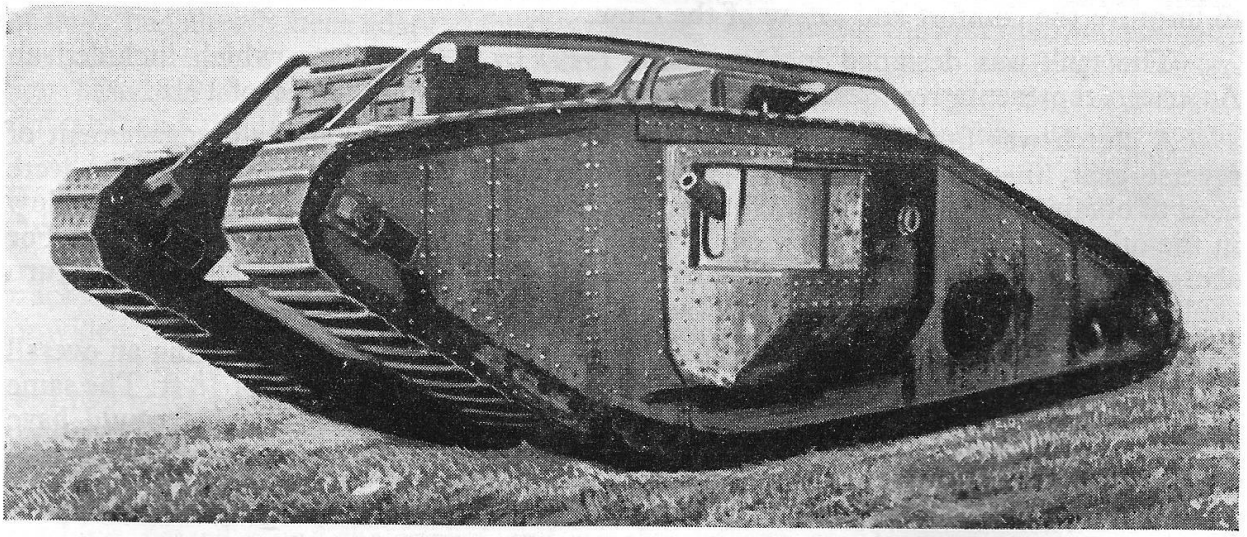
Although designed as early as December, 1916, the Mark VI tank did not reach the production stage, as the urgency for a high output of tanks precluded the introduction of a new type.

It was designed by Major Wilson, and a 'mock-up' was built. The most striking feature of the design was the abandonment of sponsons in favour of one six-pounder gun mounted in the centre line forward. Owing to the projecting horns, the traverse of the gun was limited to forty-five degrees. The engine was placed on one side of the hull, to allow for a central fighting chamber in which the crew could stand upright and obtain all-round machine-gun fire. The track width was increased to 29½ ins., giving improved performance on soft ground. Heavier armour (14 mm.) and the more powerful engine (Ricardo 150 h.p.) increased the weight to 30 tons.

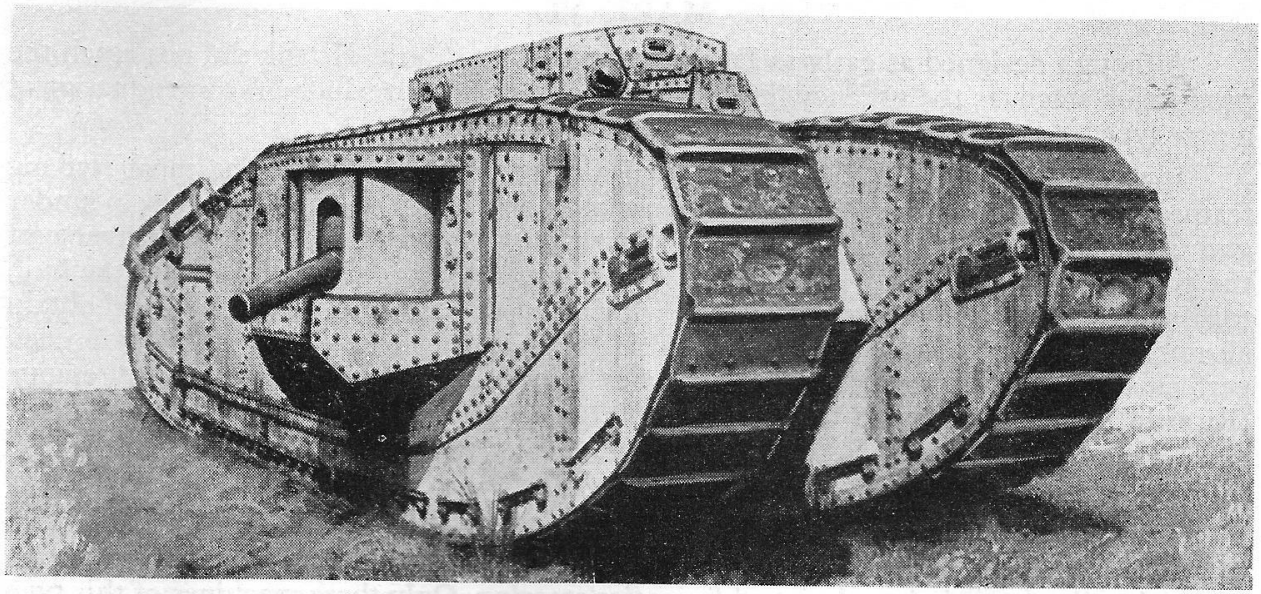
MARK VII

This machine was designed in December, 1917, and, except for an increase in length of 3 ft. 6 ins., the hull details were similar to the Mark V. The main innovation was hydraulic transmission, designed for easier steering. Only three machines of this type were built.

The drive was taken through a reduction gear to the gearbox, which consisted of two hydraulic pumps. Speed was controlled by two handwheels by which the driver controlled the pressure output from the pumps, the gear ratios being infinitely variable. This control was also used for steering, as each track was controlled separately.



MARK VIII



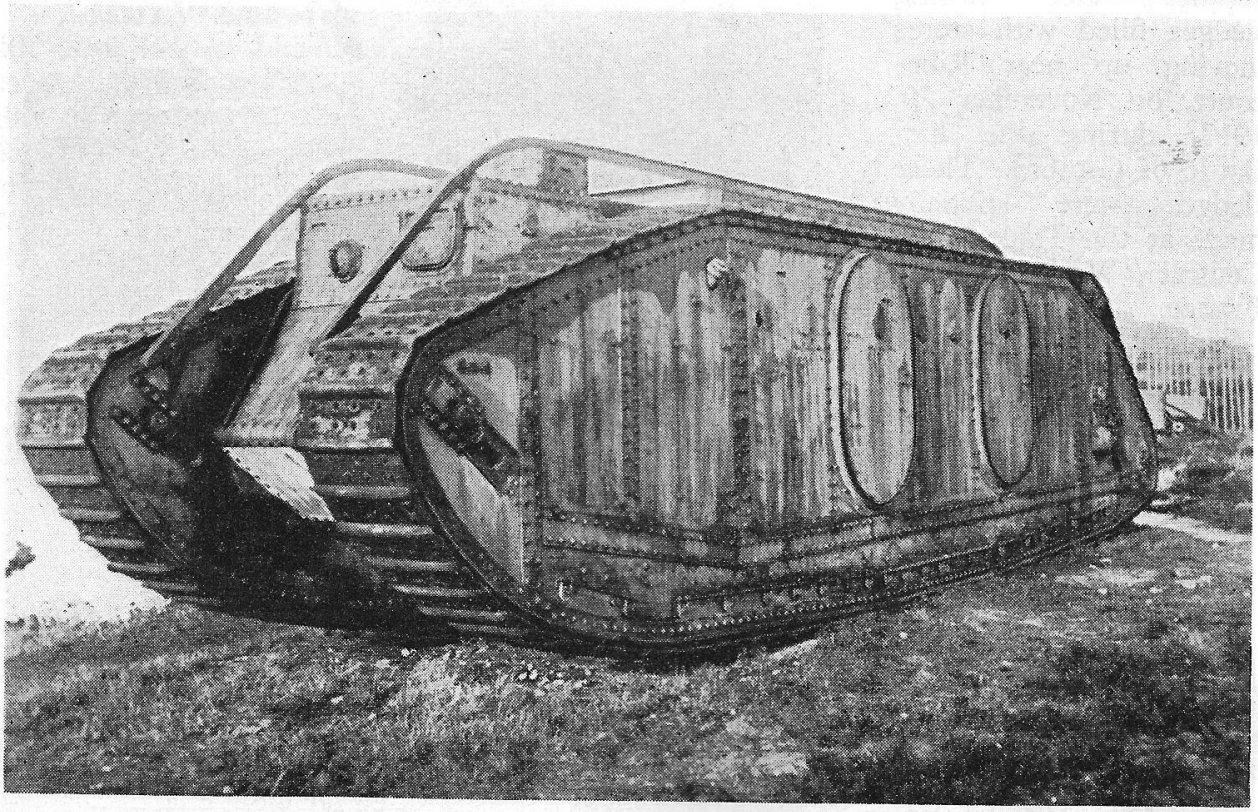
This was the largest tank constructed in the 1914-18 period, having an overall length of 34 ft. and a total weight of 37 tons. The Mark VIII, sometimes called the 'Allied' tank, was primarily intended for the American Army, and it was to have been built in the U.S., using a 300 h.p. Liberty aero engine. For British use a 300 h.p. Ricardo engine was designed. The engine was cut off from the fighting chamber by a bulkhead to improve the comfort and safety of the crew.

The tank was designed in December, 1917, by a Committee which included an American representative. Seven were built in this country by the end of 1918.

A clutch was fitted to the flywheel and was only used to facilitate engagement of reverse gear, there being no main gearbox. Two compound epicyclic gearboxes were used to obtain neutral and two gear ratios. By selecting high gear in one epicyclic and low in the other it was possible to obtain a 'powered turn' with a radius of 10 ft. 6 ins. For sharp turns low gear was selected on one side and neutral on the other, when a skid turn could be made by applying the footbrake.

An even larger machine was designed but not built (Mark VIII*), having an overall length of 44 ft., a total weight of 42 tons and a trench crossing capacity of 18 ft. The same transmission was to have been used, but with four-speed epicyclics. This would have resulted in four different turning circles of fixed radii, dependent on the gears engaged in each epicyclic.

MARK IX



This machine was designed in September, 1917, to meet a requirement for carrying infantry and stores over broken ground in an enclosed armoured vehicle. Earlier marks of tanks had already been adapted for this purpose, but this was the first machine specially designed to carry stores. In order to retain standardisation as far as possible the design was based on the Mark V. The main departures were the placing of the engine well forward, and the slope at the back end being made as steep as possible. By this means a hold was made available in the centre of the machine encumbered only by the long transmission shaft running fore and aft on the centre line. The hold capacity was 550 cubic feet, which was sufficient to carry 50 men or 10 tons of stores.

A light structure was also arranged along the whole length of the hull between the tracks for stowing cargo on the roof. Shackles, eyebolts and removable partitions were provided for stowing cargo inside. The vehicle was designed by Lieut. Rackham and 35 were built by the end of 1918. The laden weight was 37 tons, and the crew of four included two machine-gunners.

Improved ventilation was obtained by completely enclosing the engine with an asbestos lined metal casing extending to the roof, where air louvres were fitted. Fan vanes were fitted to the flywheel. Thus a continuous current of air was drawn from inside the machine, passed round the engine, and out through the roof louvres, carrying away all fumes and heat.

A development was the Mark IX DUCK, which, with the addition of 'Camels' strapped on the side, could be successfully floated.

WWI Machine Gun Tactics - 2

An air-cooled and thus water-free and lighter version of the MG 08/15, designated as the MG 08/18, was battlefield tested in small numbers during the last months of the war. The MG 08/18's barrel was heavier and it could not be quick-changed, thus overheating was inevitably a problem.

Many German commanders would have liked to have tried similar things at an early stage, but for most it was not to be. So it was that whilst the Battle of the Somme inflicted massive casualties on the attackers, the impact of the light machine gun was noted with considerable trepidation and envy by German commanders. As General von Stein, commander of XIV Reserve Corps, in charge of the front between Monchy and the Somme reported to First Army headquarters:

The attack on the 1st July was well prepared, and the [British] infantry was splendidly equipped with all kinds of weapons for close combat. It was provided with large numbers of Lewis guns which were brought into action very quickly and skilfully in newly captured positions. It is very desirable that our infantry should be equipped with a large number of light machine guns of this description in order to increase the intensity of its fire.

A few months later German IV Corps was commenting on the way that British infantry had learned much since the autumn of 1915, specifically that 'The English infantry showed great tenacity in defence. This was especially noticeable in the case of small parties, which, once established with machine guns in the corner of a wood or a group of houses, were very difficult to drive out'. One way to counter these developments would be to increase the numbers of German guns, preferably to thirty or more per regiment. Tactically, it might then be possible to secure thinly held lines by 'placing supports (infantry and machine guns) distributed in groups according to the ground, as close as possible behind the foremost front line'. As regards specific designs of guns and mounts, the following suggestion was made:

Machine guns usually have to be brought up over open ground under a heavy barrage. The great weight of the gun has again proved to be a serious disadvantage under these conditions. Even if the gun is dismounted, it is very difficult to drag up the heavy sledge over ground which is under fire. All regiments are unanimous in recommending the introduction of a lighter form of gun carriage, modelled on that of the improvised gun carriage used by machine gun marksman sections. One regiment has obtained good results with a gun carriage of its own invention, which is even lighter.

Design and production problems ensured that no quick answer was forthcoming. A few light machine guns had been obtained relatively quickly, and these were predominantly of three types: the Danish-designed Madsen, the home-grown Bergmann and some captured Lewis guns. The small numbers and disparate models used did not help, nor were the early tactics devised particularly advanced. The few Madsen-equipped Musketen units, for example, are recorded as being used essentially in a 'back stop' defensive role during the Battle of the Somme – the four-man gun teams being deployed just behind the front line to cover vulnerable gaps.

The ideal answer would have been a home-designed and produced true light machine gun that took the Lewis and other Allied and Central Powers weapons as a starting point and improved upon them in such a way as to make a highly portable arm to supplement the long-range heavy machine guns. This did not happen for a number of reasons. For one thing there was a fear that a truly new and effective design would take too long to produce, for another there were worries that it was difficult enough to train sufficient men on one type of gun without introducing something radical and untried in the midst of war. Therefore, the gun which was produced played safe, but still took time to get into the hands of the troops. The MG 08/15, as its name suggests, was first conceived in 1915, and was essentially a lighter variant of the old heavy MG 08. It retained the basic Maxim mechanism and a slightly smaller water jacket, but added a shoulder stock and small bipod. The whole outfit was still 20kg with the water jacket filled – or almost fifty per cent heavier than the Lewis gun.

Though eventually produced in large numbers by seven manufacturers, the MG 08/15 reached the troops only gradually. About 2,000 were made by the end of 1916, less than 50,000 during 1917, and the vast majority (over 80,000) were made during the last year of war. This cannot but have hindered the development of small-unit tactics, since the British, by comparison, had enough Lewis guns to begin the evolution of platoon action based around light machine guns as early as 1916. The total number of Lewis guns may eventually have been roughly the same as the total number of MG 08/15s produced, but British production was running roughly a calendar year ahead of German, with 25,000 made before 1916 was out. Elementary distinctions between the tactical roles of 'heavy' and 'light' machine guns were determined by the British early in 1916, with the manual The Tactical Employment of Machine Guns and Lewis Guns appearing in March. The widespread adoption of 'Lewis gun sections' within platoons in 1917 was formalised by February of that year with the Instructions for the Training of Platoons for Offensive Action.

Ludendorff was clearly frustrated by the slow tactical progress made with German light machine guns, as he later explained in his memoirs:

In the infantry company the light machine gun had to become accepted as a normal part of the unit. It was still viewed as a weapon ancillary to the infantry. The fact that the light MG is itself part of the infantry and the infantry carry the gun had not yet penetrated into the marrow of the infantry, never mind the army. The light MG, because of its firepower, was and had to become the main component of the infantry's firepower in combat … Light machine gun and gun carrier formed groups of infantry marksmen who, if danger arose, if the fighting was a matter of life and death, had to hold together…

This statement was, however, at least slightly disingenuous for two reasons. Firstly, the infantry had very few light machine guns except what they could capture from the enemy until early 1917. It was not, therefore, reasonable to assume that they would absorb every tactical nuance as quickly as troops that had been armed with similar, or better, weapons for many months. Secondly, as First Quarter Master and most senior figure next to Hindenburg, it can reasonably be suggested that deficiencies in this department were at least partly Ludendorff's own responsibility.

So it was that although German light machine gun experiments and theory, as developed through the Stormtroops and other small units, may have been almost as well advanced as the enemy, practical

implementation ran far behind and was made worse by the fact that the German front was inevitably much longer than that covered by the British. The result was that at first there were only two MG 08/15s per infantry company, with a goal of three set for February 1917. Initially, these were pooled together within the fourth platoon of the company. By the end of 1917 some companies on the Western Front could boast as many as six light machine guns, but in the East one or two remained the norm long afterwards. Only in January 1918 were there enough light machine guns to have a minimum of four per company, making it possible to fully equip the assault units deployed in the Spring Offensive. Now each platoon could have at least one light machine gun squad of eight men, with four gunners and ammunition carriers and four riflemen supporting them. This allowed infantry tactics universally based upon platoons made up of different types of Gruppe or squad, with each platoon having the fully effective integral fire support of a machine gun. In some instances, where there were enough machine weapons, a Gruppe even operated as a mix, having a four-man machine gun section combined with a larger number of riflemen. These fully integrated squads were known as Einheitsgruppen, being ‘uniform’, ‘single’ or ‘standard’ squads.

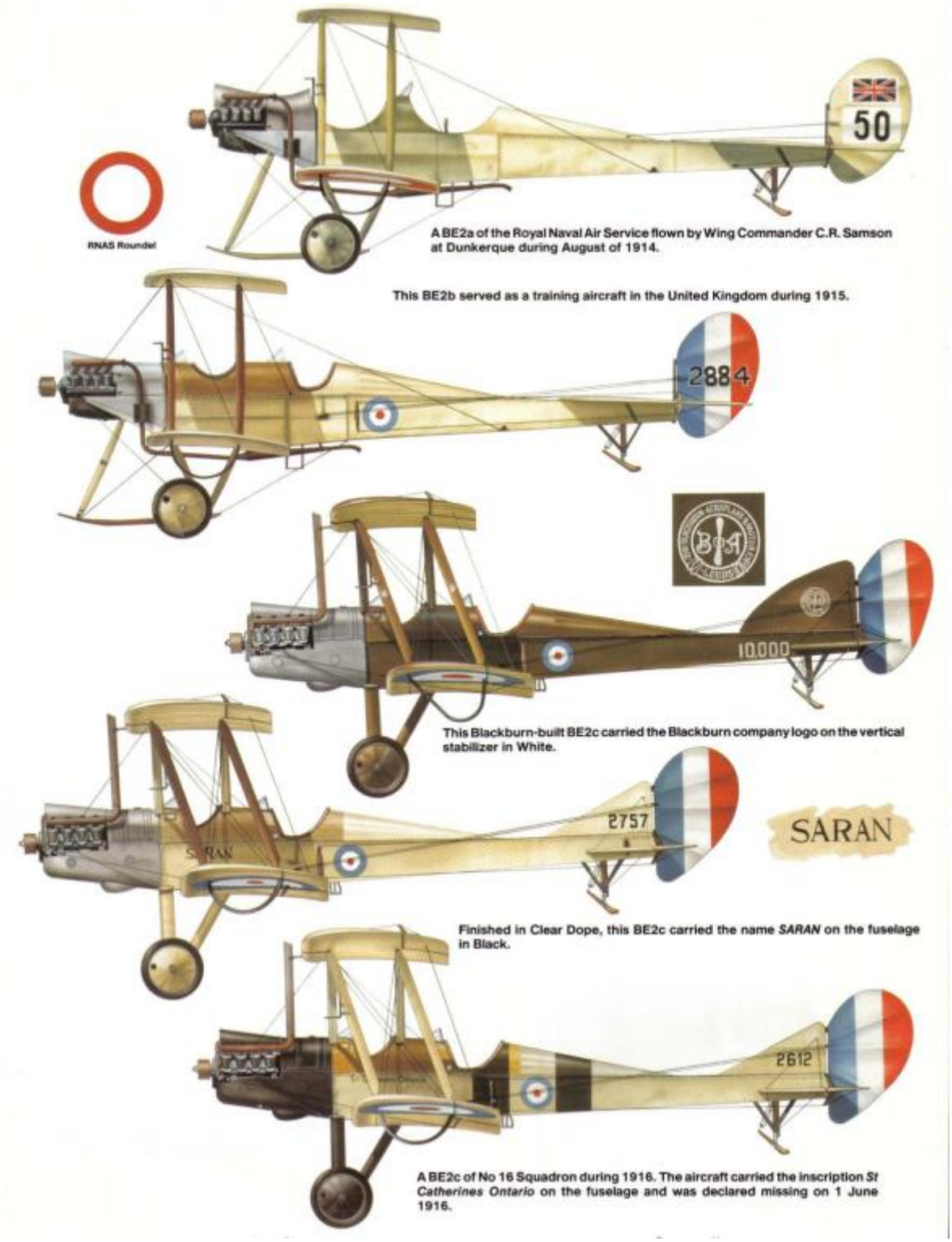
During 1918 the different types of squad were put together in various proportions to create platoons with the flexibility required for the task in hand. A good example of how this was achieved is furnished by the elite Bavarian Leib Regiment. In its Kampfzugen, or ‘battle platoons’, there were two Einheitsgruppen and an assault squad or Stossgruppe. In the ordinary or ‘line’ platoons there were four squads: two light machine gun, and two rifle. There were also ‘expansion’ platoons consisting essentially of a reserve of men, and specialist squads for the grenade launcher and reconnaissance. After the war, as the army was boiled down to its irreducible minimum, there would be greater uniformity and a generalised use of the mixed Einheitsgruppen as genuinely standard units. So it is that Bodo Zimmermann’s inter-war manual Die Soldatenfibel shows fourteen-man Gruppe comprising two Truppe, or sub section ‘troops’, one being the LMG Trupp of four men, the other the Schutzentrupp, or rifle troop of nine, the whole being led by a Gruppenfuhrer, or squad leader.

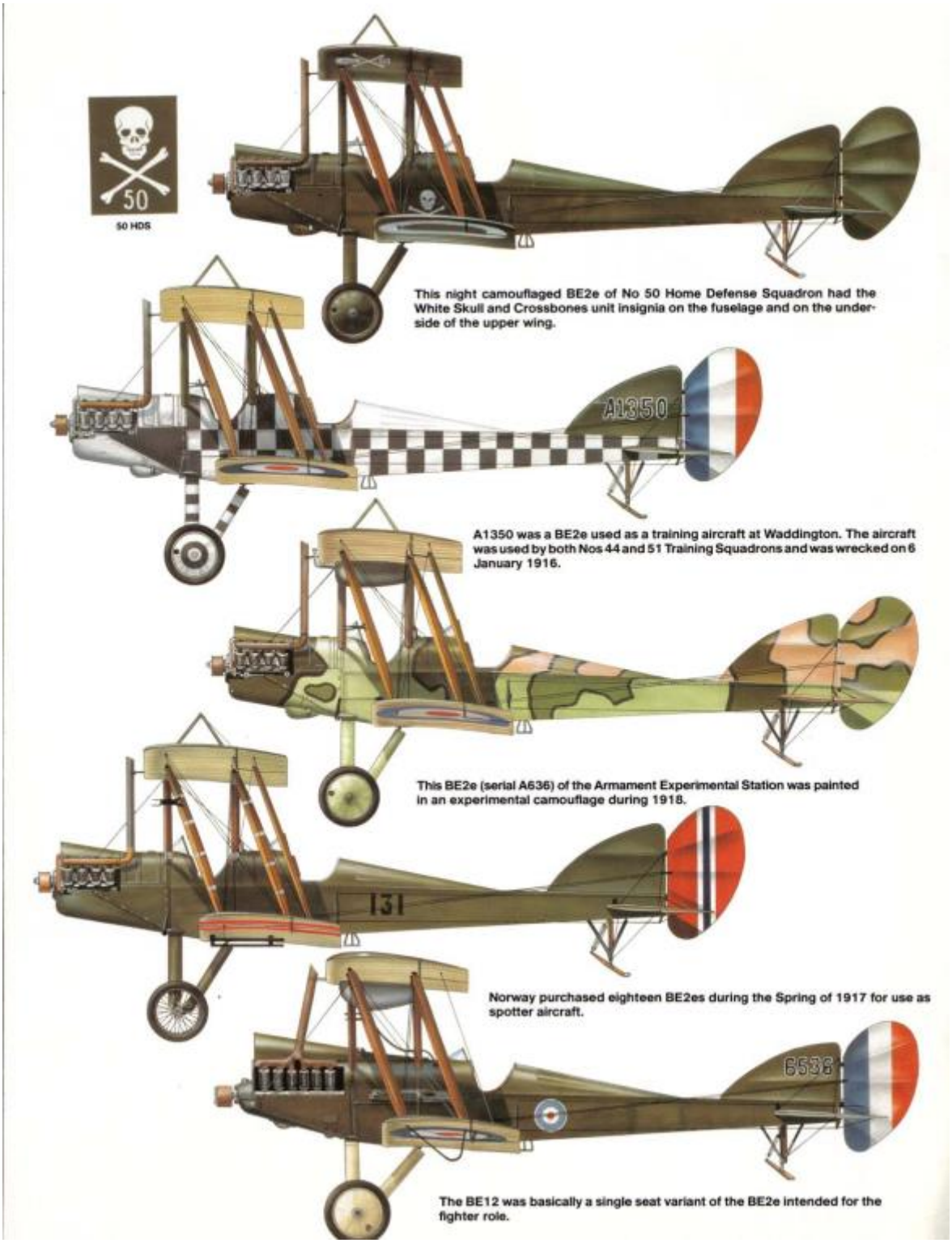
The clear distinction now drawn between the roles of the ‘heavy’ and the ‘light’ machine guns was well illustrated by the ‘Machine Gunner’s Catechism’ captured from a prisoner of the 2nd Machine Gun Company of the 13th Wesphalian infantry regiment, by the French early in 1918. This simple ‘question and answer’ style document was apparently intended as a simple aide-mémoire of tactical battle tips for troops. According to this, the purpose of the ‘heavy’ MG 08 was to be the weapon of the Zwischenfeld, literally the ‘mid-field’ or intermediate zone. Set up in reserve positions, supporting points and machine gun nests, and provided with dugouts and camouflage, its job was to act as a stop against any enemy penetrating through the first line so as to threaten German artillery. Given alternative positions, and guarded by a sentry to prevent it being taken by surprise, it was best located for flanking fire. It could similarly be used over obstacles, and against aircraft and tanks. It could also shoot over advancing friendly infantry, provided that there was at least five metres of overhead clearance.

For particular fire missions, heavy machine gun special tasks might include harassing fire and barrage fire. In the harassing role during daylight, it could be aimed ‘upon the most frequented routes’, and single shots used to discomfit anyone attempting movement. The weapon might also then be locked into position to cover the roads with bursts of fire at opportune moments. Barrages fired by groups of guns could be shot at long range to saturate particular target areas. Again, the objective might be as much to deny an area to the enemy as to destroy a designated target. By contrast, the ‘light’ machine gun was seen only as a front-line piece, to be ‘par excellence … a weapon of defence against assault in the infantry lines’. Its usual position was loaded ready to fire in a dugout. From here it could also be carried forward into the attack. The first duty of its ‘No 1’ crewman, having reached the enemy trench was to ‘make sure of a good field of fire, so as to be able to annihilate the enemy with his fire when the counter-attack is made’. Unlike its heavier cousin, the light machine gun was to limit its shooting to ‘well-placed and visible’ targets.

Useful as the MG 08/15 proved to be in finally liberating squads to act under their own covering fire, German commanders, including Ludendorff, were aware that it was not as light or handy as comparable US or British weapons. To this end, a new 'light' machine gun was under development at the end of hostilities. This was the Erfurt-made 08/18 which married up the familiar Maxim mechanism with a lighter air-cooled barrel. The new gun reached production stage, but it is unclear what, if any, combat they saw before the war ended.

Death Over the Trenches: the BE.2 Part I





The Albatros Scout cruised high over the front line, its young pilot eagerly scanning the drab, churned-up earth beneath, searching for the tell-tale flicker of movement that would betray the presence of an Allied reconnaissance aircraft. It had been several weeks since he had joined the famous Jagdstaffel 2 ‘Boelcke’, and he had yet to score his first victory, a fact that caused him some frustration, surrounded as he was by some of Germany’s top fighter pilots.

Now, on this morning of 27 November 1916, he was to have his chance at last. Just as he was about to go home, he sighted a British biplane, a couple of thousand feet lower down. Diving to the attack, he opened fire and saw his bullets ripping into the biplane’s wings. The aircraft went down in a fast descent, its pilot apparently intent on getting down in one piece before the German shot him out of the

sky. It crash-landed in no-man's land quite close to the British lines. The pilot and observer jumped from the cockpit and ran to the comparative safety of their own trenches. The German pilot circled overhead, raging. Since the biplane had come down outside German territory, there was no way of claiming it as a 'kill'; the German infantry who had occupied that particular sector had pulled out early that morning, and consequently there would be no witnesses.

Quickly, the young German decided on a drastic course of action. Throttling back, he glided down to land among the shell craters and came to a stop a few yards from the wreck of the British machine. Jumping down, he ran through the clinging mud and scrambled onto the biplane's splintered wing. He reached into the rear cockpit and pulled the machine-gun from its mounting. Burdened by his trophy, he stumbled back to his aircraft and threw himself into his seat, dragging the machine-gun with him. Mud sprayed up behind the wheels as he opened the throttle. Bullets crackled around him as the Albatros lurched into the air, but miraculously none struck home. That night, the machine-gun was mounted in the officers' mess of Jagdstaffel 2.

The German pilot was Leutnant Werner Voss, soon to become legendary as the 'Hussar of Krefeld', whose score of enemy aircraft destroyed would rise to forty-eight before his death in action in September 1917.

Voss's first victim, on that day in 1916, was a Royal Aircraft Factory BE.2c. It was an aircraft that was easy to fly; it had no vices; and it was inherently stable in flight. In combat, it was a death trap.

In 1909, HM Balloon Factory at Farnborough, which as its name implies had been involved in the production of lighter than air craft, began building aeroplanes. In 1912 the company changed its name to the Royal Aircraft Factory. Its first aircraft product, built in 1911, was the BE.1 (Blériot Experimental) tractor biplane, which was first flown on 1 January 1912. The pilot was 30-year-old Geoffrey de Havilland, who had joined the Balloon Factory in 1910. The rather curious Blériot Experimental designation was a smokescreen to cover up the fact that the aircraft had been designed by de Havilland and to give the impression that it was a repaired Blériot type machine, for at that time the Balloon Factory was authorised to carry out repair work only.

The BE.1, which was built around a Wolseley engine, was quite an innovative design. It was followed by the BE.2, which used the same basic airframe and was the first military machine to be built as such in Britain. The BE.2 was one of the first successful attempts at building a fuselage biplane with a tractor engine driving a four-bladed propeller. The wings were of two-spar structure, supported by two pairs of struts on each side. The fuselage was rectangular in cross-section with curved top decking, the pilot and observer being seated in tandem. The elevator and rudder were of metal construction with fabric covering. The BE.2 was powered by a 70 hp air-cooled Renault engine and, like the BE.1, it was used to carry out a great deal of trials work. Four BE.2s were ordered by Vickers, and the Royal Aircraft Factory was authorised to build another five.

Much of the experimental work with the BE.1/BE.2 involved improving the type's stability, a characteristic that was to prove its Achilles' heel; but this was something which, until the BE found itself in a combat situation, no one could have envisaged. The unit that pioneered the BE's entry into service with the Royal Flying Corps (RFC) was No. 2 Squadron, one of the RFC's first heavier than-air units (No. 1 Squadron being equipped with balloons and airships at this time). The RFC pilots liked the BE, and No. 2 Squadron crews faced a stern test in January 1913, when they were ordered to deploy from their original base at Farnborough to Montrose, on the east coast of Scotland.

An official history of the RFC records:

Five of its officers did the journey in nine days, two of them in BEs and three in Maurice Farmans. They took off on the 17 February, and that evening Lieutenant C.A.H. Longcroft, having been compelled to land at Littlemore, near Oxford, spent the night in the local lunatic asylum. The next stop was Newcastle. Only two of them reached it in the day and these had had to land many times to ask the way. The directions they received were more suitable for land than air travelers, since ‘turnings in the road and well-known public houses are not easy to recognize from the air’. By the 26 February they had all arrived at Montrose, and here a period of strenuous training began. By September they had advanced sufficiently to take part in the Irish Command maneuvers, flying 400 miles each way to do so with no engine failures.

When the RFC deployed four squadrons and sixty-four aircraft to France on 13 August 1914, a few days after the outbreak of war, two of them (Nos 2 and 4), were equipped entirely with BEs. By this time, new models of the basic design had made their appearance, production having given way to the BE.2a with wings of unequal span; the BE.2b with revised decking around the cockpits and ailerons instead of wing-warping controls; and the BE.2c.

The BE.2c, which appeared in the spring of 1914, differed radically from its predecessors. Its wings had greater stagger and dihedral, but the principal innovation was the addition of ailerons on all four wing sections. These changes further improved the stability of the aircraft, which was enhanced even more by a greatly increased rudder area. The undercarriage was also of a new design and much simpler, dispensing with skids. The wing tips were reshaped, becoming less rounded, and neat cut-outs at the trailing edge of the lower wing roots greatly improved downward visibility. The engine, designated RAF-1a, was a British version of the 70 hp Renault, with the output increased to 90 hp.

The first wartime flight by a BE was made on Wednesday 19th August, when Lieutenant G.W. Mapplebeck of No. 4 Squadron took off from Maubeuge to make a reconnaissance of Gembloux, where enemy cavalry had been reported. He sighted a small group of them, and duly reported the fact back at his base.

Time after time, during the following weeks, the BE proved its worth in the air reconnaissance role. It had a longer range than most of the other types used at that time by the RFC, and consequently could penetrate deeper into enemy territory. On 15 September 1914, for the first time, the RFC made operational use of wireless telegraphy during artillery observation. Two BE.2s of No. 4 Squadron were involved. The pilots were Lieutenants D.S. Lewis and B.T. James, both of whom were later killed.

In March 1915 the British launched an offensive at Neuve Chapelle, an attack based – for the first time in history – on maps prepared solely from intelligence gathered by aerial photographic reconnaissance, much of it undertaken by BEs. As the assault got under way, the RFC launched the first tactical air bombing offensive, intended to delay the progress of enemy reinforcements. Again, the BEs were in the thick of the fighting. Aircraft of Nos 4 and 6 Squadrons attacked the Menin junction and railway stations at Courtrai, Lille, Douai and Don, using 25 lb and 11 lb bombs. In April, BEs of Nos 2, 7 and 8 Squadrons also attacked railway stations during the battle for Ypres. It was during this battle that Lieutenant W.B. Rhodes-Moorhouse of No. 2 Squadron became the first RFC pilot to be awarded the Victoria Cross. Descending to low level to make sure of hitting a target on the line west of Courtrai railway station with his 100 lb bomb, he ran into heavy rifle and machine-gun fire. Despite being wounded three times, he regained his airfield at Merville, but succumbed to his wounds the next day.

The early part of 1915 saw massive strides in the development of the embryo science of air fighting. Right from the start of the conflict, it had been obvious that the machine-gun provided the best means of both attack and defence for the crew of an aircraft; this had already been demonstrated during trials

in Britain, France and the United States in the years leading up to the outbreak of hostilities. There were several problems to be overcome, however, before the solution became a practical reality.

First, machine-guns could be fitted only to the sturdier of the types then in service; on other aircraft, the weight penalty was unacceptable. There was also the problem of aiming and firing any sort of gun, as the pilot and observer were surrounded by a considerable wing area, with its attendant struts and bracing wires, and seated either behind or in front of a large and vulnerable wooden propeller. Nevertheless, the RFC and RNAS (Royal Naval Air Service) quickly adopted the 27 lb American-designed Lewis gun as standard armament for their observation aircraft, particularly the 'pusher' types in which the observer, who sat in front of the pilot, had a large cone of fire upwards, downwards and on either side. In the beginning, the gun mounting was usually devised by the observer to suit himself. The French selected the Hotchkiss, which like the Lewis was air-cooled; a belt-fed weapon, it initially proved too inflexible for the observer to handle and so a drum feed was adopted. The Germans chose the lightweight Parabellum MG 14, a modification of the water-cooled Maxim; this also had a drum magazine.

The BE.2c was the first variant to be armed with a machine-gun, the primary reason being that in the early versions the observer had occupied the front cockpit, from which it would have been impossible to use such a weapon. The reconnaissance biplane now had at least some defence against the German scouts that were now becoming organised into efficient fighting units; but technology was about to come into play that would give the Germans almost total air superiority over the Western Front for months to come. The new development was the synchronised machine-gun.

'Synchronisation' meant, quite simply, relating the rate of fire of a machine-gun to the rate of revolution of a propeller, so that the bullets missed the advancing and retreating blades, enabling the gun to fire forwards through the propeller disc – which in turn meant that the whole aircraft could be used as an aiming platform. The device was perfected by Anthony Fokker, the Dutch designer who, having been turned down by the British and the French, was building aircraft for Germany. Fokker designed a simple engine-driven system of cams and pushrods that operated the trigger of a Parabellum machine-gun once during each revolution of the propeller; in effect, the propeller fired the gun. The mechanism was successfully demonstrated on a Fokker M5K monoplane. This aircraft was given the military designation E.I (E stood for Eindecker or monoplane), and so became the first of the Fokker monoplane fighters.

The 'Fokker Scourge,' as it came to be known, began on 1 July 1915, when Leutnant Kurt Wintgens of Feldflieger Abteilung (Flying Section) 62, flying the Fokker M5K, shot down a French Morane monoplane. There was no doubt about this claim, but since the Morane fell inside French lines it was not upheld by the German High Command. Meanwhile, the production Fokker E.I had begun to reach the front-line German units in June. The small number of machines available, in the hands of pilots whose names would soon become legendary, began to make their presence felt. Foremost among them were Leutnants Max Immelmann and Oswald Boelcke, both of Feldflieger Abteilung 62. The definitive version of the Fokker Eindecker was the E.III, some of which were armed with twin Spandau machine-guns. Abteilung 62 rearmed with the new type at the end of 1915. The Fokker Eindecker was the first dedicated fighter aircraft to see operational service, and for months it made Allied reconnaissance flights into German territory virtual suicide missions.

Fokker Eindecker EIII