

BERT CASCIANI's DG.ENG BUGLE

MEMOIRS OF WOOLWICH ARSENAL



Many of you will remember Christine Pye as we knew her from when she worked in DG Eng for Alan Jeffs as his secretary from about 1978 to 1982.

Chrissie lost her beloved Dad on the 18th of January and after having enjoyed the various stories put together by old colleagues in DGEng and its associated departments she felt that we might like to use the story he had put together apropos his working life through his apprenticeship during the war years and his changing experiences up to and past his retirement. We have now put this together in this Bulletin believing it is a wonderful story and well worthy of passing on to all of you, so please read and enjoy."

Part I

Before I start Dad's story I thought it would be interesting to tell you something about Woolwich Arsenal itself as he remembered it; so here goes:

ROYAL ARSENAL WOOLWICH

In its heyday, Woolwich Arsenal was one of the largest weapons manufacturers in the world. The Arsenal followed the River Thames on the northern side from Woolwich to Plumstead and Belvedere marshes. The southern side roughly followed the Chatham and district railways and varied in depth from 1 - 3 miles. There were entrance gates:

- Main Gate- Woolwich town centre
- Second or Middle gate in Plumstead road
- Third gate likewise.
- Fourth gate at Plumstead Bridge, with access to the main rail network. Manor way gate at Plumstead corner"
- Harrow gate at Abbey Wood.

A canal with lock gates gave direct access to the River Thames. There were 3 piers all deep water, giving access to the largest vessels.

Viz:

1. The 'T' pier 250 tonne crane
2. The 'Iron' pier with a 200 ton crane
3. The Crossness pier at Belvedere solely for loading explosives and field ammunitions.
4. It also had its own pier for unloading coal for the Arsenal's own gas factory by a direct conveyor system and to their private power station (electrical).

Woolwich Arsenal started by casting gun barrels and cannons for the Navy, and progressed to the making of all kinds of carbines, pistols, rifles and grenades and progressed through the ages to the 14, 16 and 18" guns of World War I and World War II and gun barrels of all kinds.

What kinds of processes and plant did the Arsenal have? It smelted its own iron in 2 open-hearth furnaces; also 2 Bessemer converters for steel production. In one electrical arc furnace, they produced their own forgings and castings, steam hammers and hydraulic presses for forming billets and blooms into whatever shape was required; forging shells of all sizes for subsequent machining; Rolling mills for reducing billets to hexagonal, square or round bars to very close tolerances, also a range of angle, tee and steel to requirements.

They also had a brass foundry producing a range of brass, gun-metal and bronze with specific bronzes to naval requirements and special shops for machining shells boring/screwing for fuses and explosives and for shrinking on copper driving bands. There were 2 main barrel producing factories, one the heavy gun, including (the south boring mills), these produced all 8", 10", 9.2", 12", 14" and 16" barrels and all subsequent breech components. D95 produced up to 6" and was known as the light gun factory.

The Heavy Gun factory, had 5 bays, each having 2 x 130 ton cranes (using 2 of these to lift a 16" barrel.) At the side of the Heavy Gun factory was a tall circular building called the 'Rink'. This was where the barrels and liners were tempered and heat-treated. Barrels were lowered into deep vertical pits and heated to the required temperature, and at the appropriate time lifted out by crane, then traversed and lowered into a pit filled with some quenching oil. Normally this shop was out of bounds, but a friend's father who was a foreman in the heavy gun factory arranged for us to watch a 'dip' as it was called. We were given a specific time, told exactly where to stand and then the Fire Brigade arrived in case of fire. The crane driver's cabin was covered in special glass, likewise where we were standing. The barrel was lifted out to the tempering pit, and as the barrel was lowered, smoke came up the bore and then was self ignited. It was an awesome spectacle, the flaming oil, covered the driver's cabin and continued to run all along the supporting girders, still burning, this lasted

for about 10 minutes. We also had a tailors shop making all kinds of protective clothing for explosive workers, gunners, canvass covers for gun muzzle and breeches, they also made paper products for all types of ammunition storage and packing etc.

The arsenal also had its own sheet metal workshops, manufacturing all kinds of tubing, (pipe bending to all configurations) and Ammunition boxes by the 10,000's. It also had wood mills capable of reducing 2' diameter tree trunks into 1" thick boards and all the allied wood parts as required. There were several filling sites (explosives), all separated by waterways and canals with the magazines which stored explosives and were all totally surrounded by water

We must not forget, of course, the vast well equipped machine shops, the main machine shop and C58 to name but a few. C58 was close to my heart, likewise the fitting and erections shops having some of the largest machine tools in the south of England.

Totally self-supporting, Woolwich Arsenal had a very good surgery, ambulance service, its own Fire Brigade, and its own mortuary. On this matter, we must remember those who died in ROF Woolwich, whose expertise and skills, served their country well. Woolwich also made most of the ropes etc, used in our naval dockyards. This area, known as the ropery, was to the west of the main gate towards Woolwich Dockyard; the road adjacent to the site, being known as 'Rope Yard Rails'. As a youth I can well remember the witticisms of the tram and bus conductors, such as 'Plumstead' Station next stop', and 'gate number 4 for Woolwich Arsenal rest home, please remember to take your beds', etc, etc.

Someone once said to me, "You have worked for MOD for 49 years, your life has been dedicated to making weapons of all kinds, and weapons of destruction, working at experimental establishments, to procure new and very destructive weapons, lastly visiting contractors to get the cheapest arms for the Government" This I have no qualms about at

all, I enjoyed my working life, it was varied and gave me the chance to travel to -- parts of the United Kingdom and world-wide.

Although Woolwich Arsenal was fair game for comedian's etc, it did manufacture first class weapons of destruction. Each and every component was subject to extensive checks by the shop inspection dept, any rejects had to be replaced by the machinist on a non-payment card basis. The government inspectorates carried out the final check of completed weapons of mass destruction, tanks, Lorries, guns, etc.

IFV - Inspectorate of Fighting Vehicles

CIA - Chief Inspectorate of Armaments

IND - Inspectorate of Naval Ordnance.

Later other contractors were allowed to tender for weapon contracts, but many could not produce to the high standard required and in the early post war years it was not uncommon for Woolwich ROF to rectify or complete contracts; the contractor having run out of money. At the present time with the demise of many ROF'S is it not surprising that criticism is levelled at contractors for second rate, late deliveries and inadequate weapons.

Part II

ROF WOOLWICH: (Probationary period) and 1st 6 months apprenticeship.

My working life in (ROF Woolwich) started in February 1940 at the age of 14 years 10 months. This was primarily a probation period to establish if I was a reliable, honest and trustworthy character.

I was employed in F111 engaged on packing small arms ammunition to suitable military requirements; this was mainly bandoleers of 50 rounds of 0.303 ammunition for the army. 7.92mm rounds in besa belts mainly for tanks and 0.5 rounds for the (pom pom) guns and Spitfire and Hurricane belts for the Browning guns.

My wage from 8 am - 5.50 pm Monday to Friday and 8 am to 12 noon Saturday was the

princely sum of 9s 8d, which equates to 48 p at today's rates.

Everyone in the factory was allocated an air raid shelter. When the sirens sounded you could go to your shelter or wait until the imminent danger warning when it was mandatory to leave the factory. After about 3 months we were made redundant due to extensive air raid damage. During the week, whilst we were working out our notice, the first warning sounded and we decided we would go to the canteen for a cup of tea instead! (Not the air raid shelter as instructed). Fortunately, a foreman caught us and escorted us to our designated shelter. When the all clear sounded we discovered the Rail Bridge we should have crossed to the canteen received a direct hit. In hindsight if it had not been for the foreman I would not be here today.

After working locally for about 2 months I was offered re- employment in ROF (W), again to complete my probationary period. This job was in the (danger) buildings (CF3), where all types of shells and cartridges were filled with explosives. This site was rather remote away from the main production areas. When I arrived for work, I was issued with a flannel protective suit and some shoes. I was required to take all my clothes off with the exception of underpants, vest and socks. A kit bag was made available, which all my clothes were placed in. I then crossed a red painted barrier and was now in a clean area where I donned this suit, shoes, etc. I was also issued with a small linen bag hung around my neck for any money I had.

The site had about 20 brick built buildings with lightweight roofs. (This was to deflect any explosive damage). These buildings were connected by wooden walkways about 3' off the ground. These in turn had narrow gauge rails (all brass for transporting explosive etc, from one building to another). Even the little trucks had copper wheels to minimise danger of sparks and explosions. If you happened to slip off the walkways for one reason or another, you had to sit on the grass until a (clean) pair of shoes had arrived. For this we got another 3p danger money a day.

After 3 months I was summoned to an Interview Board to assess me for my apprenticeship. After a long interview I was offered my apprenticeship subject of course, to various people vouching for my integrity.

October 1940 first year apprenticeship

My apprenticeship intake of about 20 lads was a departure from normal practise. We were to receive basic engineering instruction in Woolwich Polytechnic's workshops, which had a good range of machine tools. This period proved to be an excellent grounding for further expertise in this field.

After 6 months we returned to the ROF and were allocated to various departments and workshops. My venue was a large fitting and erecting shop, which for some unknown reason - was -and, still is called the main Machine Shop. I worked under the guidance of skilled men at all times, mainly on 4" and 6" naval guns, and 9.2" coastal defence guns.

The 9.2" guns were awe-inspiring, and surpassed anything I had ever seen before. They started life as a cast still circular steel plinth. This was cast at Woolwich and certain machine operations took place before erection; these plinths were about 8' high and 14' in diameter. These in turn supported the shell pit shield about 18-20' in diameter, on which was erected the gun cradle barrel and breech and all equipment for traversing, elevating and loading the shell and charges. All these functions were hydraulically powered. When all these details had been completed, a test run was done using all the hydraulic systems. The hoist below the shell pit shield brought up one shell about 8' long and 2 charges (explosives in linen bags). These were automatically transferred to a loading tray, which positioned it in front of an open breech. A hydraulic rammer pushed them into the breech. After firing the gun returned to a 5° elevation, the breech opened and compressed air and water sprays cleaned out any residue of the charge bags.

When we had completed all our tasks a team of inspectors and gun crews arrived to check

all operations etc. The gunners went through all loading procedures as being the actual users. The gunners informed us they could have 5 shells on the way before the first one landed on the target area. When erected on the site the plinth was about 13' down, the shell shield about 3' below ground level, this was all covered by an armoured steel turret. Tunnels to the main magazines linked the space below the ground. I thoroughly enjoyed this 6 months; the fitting experienced sustained me for the later days to give me a never-to-be-forgotten apprenticeship. This ended my first apprenticeship year.

Part III

ROF (Woolwich)

I was now resident in C58 to complete my apprenticeship as a Centre lathe turner. This factory employed approximately 250 skilled men and 20 - 30 semi-skilled personnel. It was a very large shop divided into 3 bays, having a complete range of machine tools, centre, turret, capstan and vertical lathes, vertical and horizontal milling machines, universal and horizontal grinding machines. Planing and horizontal boring machines, honing and broaching machines, gear-cutting and tooth forming, bevel gears, toothed rings up to 12' diameter, involute gears etc., and pedestal and radial drilling machines. We also had a complete section of chucking autos.

I started on medium-sized lathes about 15' long with a 9" swing, meaning you could machine to approx. 18" diameter. After about 4-6 months, starting with fairly simple basic components, myself and another lad were told we would be working together on a 2 week about night and day shift - 7am - 7pm and vice versa on a 7 day week basis due to war time instructions.

We were also on piecework, which speaks for itself. C58 was a very happy and pleasant shop to work in. The skilled work force was only too happy to help and advise us lads, and to disclose all the tricks of the trade to receptive parties.

This period was the heart of the Blitz, V1 and rocket attacks. One night about 10.30pm, when I and 4 others were enjoying a cup of tea; there was a terrific explosion and a blinding flash. The steel girders supporting the roof and cranes could be seen to be moving, and dust accumulated over years filled the shop with a black haze. We ran towards the direction of the flash (the 2 doors at the end of each bay were about 12' high and 6' wide with a small picket door for easy access. I opened the door and we ran across to the heavy gun factory. A rocket had apparently hit one of the stanchions supporting one of the 2 130 ton cranes, which had collapsed across a large gun turning lathe, trapping 5 men enjoying their tea break. Unfortunately a high-pressure gas main was broken and ignited and there was no chance of any survivors. When we returned to C58 the 2 12' doors, were laying on the ground - such were the weird effects of the blast.

Another time, men queuing to clock off on a Saturday, made a dash for 2 adjacent air raid shelters, when a fly-bomb (buzz bomb) appeared and fell between the 2 shelters, all inside were killed along with many in the area - it was said that 80 men were killed that day. With the cessation of these hostilities work seemed to drop off, no night shift or overtime, during my apprenticeship I was in a reserved occupation but within 6 months of having completed my apprenticeship, I received my conscription papers, along with many more from ROF Woolwich

POST WAR

After my RAF service I was re-employed at ROF Woolwich. We had large orders for all types of general equipment, mainly in the field of fitting and erecting to name but a few.

Viz:

Barber Greene Ditching Machines (Trench diggers for pipe laying)

These could dig trenches to various depths, depositing the earth to the right or left as required, mainly for construction companies, relaying services for electricity, gas and

sewerage undertakings. These were produced in large numbers.

Wood Machine Tools

Planers, circular saws, band saws and routers, mainly for the furniture and service industries.

Centurion Battle Tank.

Refurbishment of vehicles including 'up - gunning' from 17pdr to 31 pdr and subsequent shell bins and shell storage facilities in situ.

Centurion modification to bridge layer role.

This was a major re-build; the turret was removed to facilitate construction of a 40 ft bridge folded in 2 halves. This could span any obstacle within limits, and was a totally automatic procedure. The bridge could be positioned, the tank driven over and either picked up again or left in situ, without the crew leaving the vehicle, the pins retaining and securing tank to bridge could be blown out with a remote control charge if required.

Centurion Armoured Recovery Vehicle (ARV)

This vehicle had identical running gear i.e. the basic hull, engine gearbox all controls and tracks in addition it had a 60 ton capstan winch which could drag a damaged vehicle to repair base, it also had a power spade at the rear, to assist with towing or dragging a vehicle to a safe venue.

Centurion Vehicle Recover Equipment (AVRE)

This proved to be a 'maid of all work' vehicle fitted with a short barrel smooth bore gun 165mm with limited traverse and elevation. When travelling through captured towns with badly damaged buildings blocked roads etc., these guns could fire charges to topple buildings the rubble being removed by a 12ft wide power operated dozer blade, which also had a couple of heavy machine guns, power winch and all necessary cutting and welding equipment.

Metropolitan Vickers Turbines.

These were huge commercial turbines for our power stations, and we had special facilities to build these. These were made complete including all castings, rotors, machining etc. This was carried out in our own workshops, they were subject to very tight tolerances capable of running at top speed without any vibration' 'before acceptance by Vickers. When running at top speed the Vickers inspectors produced from a velvet bag a 12 sided mint condition threepenny piece and the final acceptance test was for the threepenny piece to stand on edge when the turbine was run from start to top speed without toppling over.

FV 432 Armoured Personnel Carriers.

These vehicles were developed on a prototype basis to be a fast low built support vehicle capable of transporting 12 fully equipped troops to the front line, large exit doors at the rear to discharge troops stepping out backwards at 20mph without stopping and returning for more men. This was an unconventional vehicle with tracks having a front sprocket drive engine and gearbox integral at the front along with the driver. This power unit could be changed in less than 1 hour. FV430, another variant using the same basics i.e. hull engine and gearbox etc, was the Abbot self-propelled 105mm gun. Although having a limited traverse and elevation it proved to be a very effective weapon.

F434 Recovery Role

This vehicle fitted with crane; winch and carrying a spare engine for field repairs. After satisfactory development a contract was placed for an initial order of 1,500 432 and variants. Although we had spacious workshops and the know-how we did not have the resources to manufacture 1,500 vehicles (only the prototypes). GKN Sankey of Bilston Wolverhampton won the contract for 1,500 432's and 434's. Vickers Newcastle secured the order for Abbot. Both of these companies were in the vehicle mass production field. Ironically, years later I went to both of these factories negotiating modifications supply of spares and

general cost investigation into production methods.

When I returned for ROF service I was mainly employed on the previously mentioned tank rebuild and modifications. Beside the tank conversions we also stripped and rebuilt 188 Matador Lorries. This was a complete strip - everything was removed from the chassis and completely rebuilt, new engine, gearbox, auxiliary gearbox, winch, front and rear fairleads for winch operation, front and back axles and road springs etc., including rebuilt cab, leaving ROF as a complete new vehicle.

We had 2 rebuild lines and there was a constant rivalry to be the first vehicle off the line and go for a road run. Sometimes this rivalry bordered on a little sabotage but it was really a happy venue with many shop outings, London shows and of course, shop organised Christmas do's!

The Tank lines were of a similar nature; Very heavy work, very competitive - but again a very happy shop. After completion in the workshop we would take the tank out on a shakedown run within Woolwich Arsenal. Then later for 30-mile road run in the country which was a perk of the job!

Myself and two others were responsible for all the inside vehicle work, engine, gearbox, air-cleaners, fuel tanks, auxiliary generator, clutch, all controls, engine doors, fans etc., and fitting tracks once the engine was running. There are some vehicles of the Centurion family running with the name 'Bagiani' stamped on the front 'chassis' plate in ½" letters. My colleague went to great lengths to establish some recognition to the vehicle build with the combination of our 2 surnames, again a very happy and pleasant work experience, but sadly I am led to believe I am one of the few survivors of these happy never-to-be-forgotten days. During the latter stages of the work schedule there was a move back to machine shops as there were large spares orders, mainly machined items and I returned to C58 where I served my apprenticeship and was mainly employed on the larger types of lathes. The principle tasks

were Centurion rear drive cases and covers. These weighed 4 cwt apiece and approx. size 3'x 2' being machined on a large gap bed lathe with a 4'6" diameter faceplate. Also Centurion cooling fans 21" in diameter cast in aluminium. Also the fan cowls which were approximately 3' square (2 per vehicle) and experimental work on the larger centre lathe. This proved to be a very lucrative and enjoyable move. During my latter period I was one of 3 shop stewards. As workloads change we received a large order for 1,500 105 mm tank gun barrels, including breech block and associated items, fume extractors, muzzle break and flash eliminators. The higher echelon decided that D95 (Light Gun factory) would be the venue for this order. The shop's gun turning lathes would be refurbished; more powerful electric motors fitted to enable the use of carbide or tipped tools. These tools should reduce machining times by 40- 50%. However, the Light Gun factory machinists were very militant, and decided to 'black' all these new methods. C58 turners were then transferred to D95 to take over this work, which we did, but with only a small number of gun turners we could not compete with the delivery schedule. The Management called several meetings but the D95 militant workforce would not accept these methods. In the background of this large barrel programme was ROF Nottingham, a war time built factory with more up-to- date machine tools and employing a semi-skilled workforce. D95ROF (W) would not accept semi-skilled labour. The management warned D95 militants what could happen. Then a few weeks later arriving for Monday's start all the barrels and associated components had gone - yes - to ROF (N). Although we still had some work, this proved to be the start of the demise of ROF (W), as a major manufacturing facility, which eventually resulted in the closure of ROF (W).

During my spell in the D95 Light Gun factory, I was advised to apply for promotion in the Technical classes and I was finally selected for the post; this proved to be a good move. I then spent a few months in the planning office, whilst there I was despatched to various locations to study more up to date methods of

metal protection (anti-corrosion) and painting methods. These venues included Park Royal vehicles (makers of London buses), Leeds tank factory, British Leyland and Vauxhall motors to name but a few. At this time we had considerable contracts for large missile containers for long time storage and a conversion contract for large 6x6 vehicles for recovery role. All these contracts involved large sections of/and sheet metal sections. It was therefore decided to bring ROF (W) up to date with a purpose-made shop for the above processes. Fifteen storage tanks (15' long x 8ft wide x 6' deep) were fitted in line with an overhead conveyor. These included cold and hot washes, degreasing, etc., phosphating to class 1 and various other processes for different materials. They were all directly connected to an infra red and hot air drying tunnel, then to a complex of 4 spray booths, 1 red oxide, 2 grey undercoat, 3 deep bronze green and 4, second deep bronze green topcoat. We also had an automatic stoving oven (gas powered) said to be the largest in the south of England, and capable of handling the largest computer cabinets known. It was used for stoving finishes to a very high standard. Such was its capacity and volume of gas usage that we had to give 48 hours' notice to the gas authorities before usage. This proved to be a very successful project and was kept fully utilised for several years.

BAD NEWS DAY.

One Monday I went home to dinner and on the 1 o'clock news it said a decision has been made to close Woolwich Arsenal and it would be run down over the next 5 years. On Tuesday my department manager, rang me in my office and said, pop over as soon as possible, I replied I have just made a cup of tea - "leave that and come over now" he instructed. On arriving in his office he said "Did you hear the news?" "Yes," I replied. "I have been very satisfied with your efforts - I have arranged for you to go in the same grade to Fort Halstead. I agreed and later went for my interview to the Establishment and started 2 months later this was my severance with Woolwich Arsenal.

Although I was moving on, but still employed by MOD, my thanks to all at Woolwich ROF for my selection as an apprentice to the workforce that instilled their expertise to me - helping and advising at all times, and imparting their own particular skills, guiding me to a lucrative and happy working life; Having said that I had moved on. At Fort Halstead, I was employed in workshop technical services. This was planning and production of prototype weapons to be produced in our own workshops. Drawings were issued to the workshop floor giving all production methods, materials supplied, bought out and sub contract items, visiting sub-contractors to arrange manufacture and costs etc., and in general monitoring the job to completion.

Another very interesting job, I was then approached by a Cost Investigation branch (Principal Directorate of Technical Costs) to join a team to check production costs and estimates for all kinds of weapons and spares to curtail excess profits etc. We would be resident at the company for as long as required to investigate production costs and estimates of time taken plus allowances to arrive at a fair and reasonable price. Over 29 years in this post, I visited probably every major engineering company all over England and some abroad. PDTC was a very effective cost saving branch. I went to good companies and others and had good relations with some - constant arguments with others but survived nevertheless.

Having retired in 1989 after 49 years' service, I work on a purely voluntary basis to help restore the largest claimed beam engines in the world, at Crossness, Abbey Wood, and South East London. I have been there 21 years now and use my skills and expertise to get these engines in service again. These engines are 150 years old and the largest rotative beam engines in the world. I am happy to use my expertise from my Woolwich Arsenal training to help refurbish these engines and pass on some of my expertise for the sake of posterity; I also believe I could follow this up with stories of our good and bad days at Woolwich Arsenal.



Chrissie's Mum and Dad



Chrissie with her beloved Dad

Albert Casciani

13th March 1925 – 18th January 2019

These are my father's memoirs from his wonderful career, a Dad I am immensely proud of. I hope all of you who read this are also thankful for the sort of men who made this country proud!

Chrissie Retallicik

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