

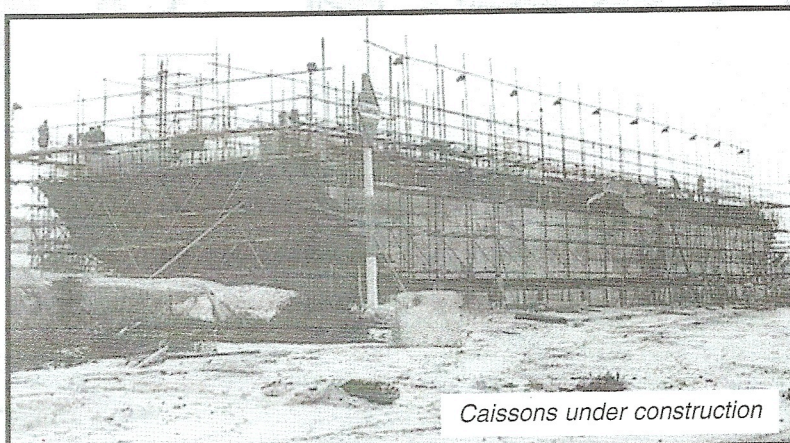
PAGHAM AT WAR !

A Wartime Experience Introduction

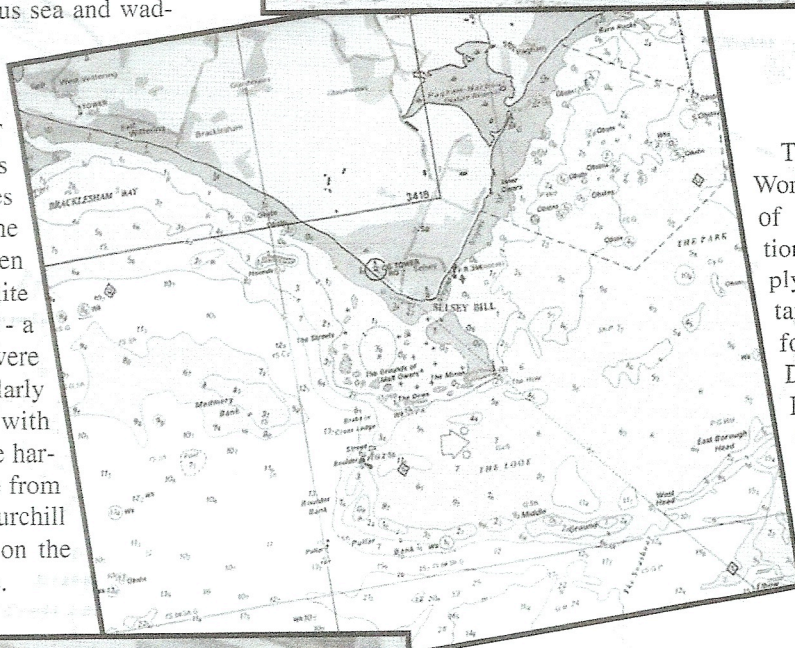
A young volunteer, Admiralty Ferry Service, 1944 at Pagham, West Sussex, relates the arrival of the "PHOENIX" caissons, eventually forming the outer walls of the "Mulberry Harbour" at Arromanches and St. Laurent.

The heading "Pagham at War" would seem appropriate and the text, this is Codename "Mulberry" gives the wider view of this brilliant British design and engineering achievement. Philip Hawes.MRICS.,MRIN.,DTi.YM,OCEAN

Today we can walk round the footpaths of Pagham Harbour Nature Reserve enjoying the peaceful scene and the sight and sound of the numerous sea and wading birds at high or low tide, finally reaching the beach head looking out to sea. In 1943/1944 it was a very different scene - we were AT WAR. Although the harbour was covered and uncovered by the tides it was a scene of great activity. The fields at Church Norton had been taken over by the RAF and a satellite airfield created. Hawker Typhoons - a rocket firing fighter aeroplane - were based there. The Typhoons regularly practised firing their rockets with dummy heads at a small ship in the harbour and at additional targets made from scaffold tubes and canvas. A Churchill tank and a lorry were positioned on the beach head for extra target practice.



Caissons under construction

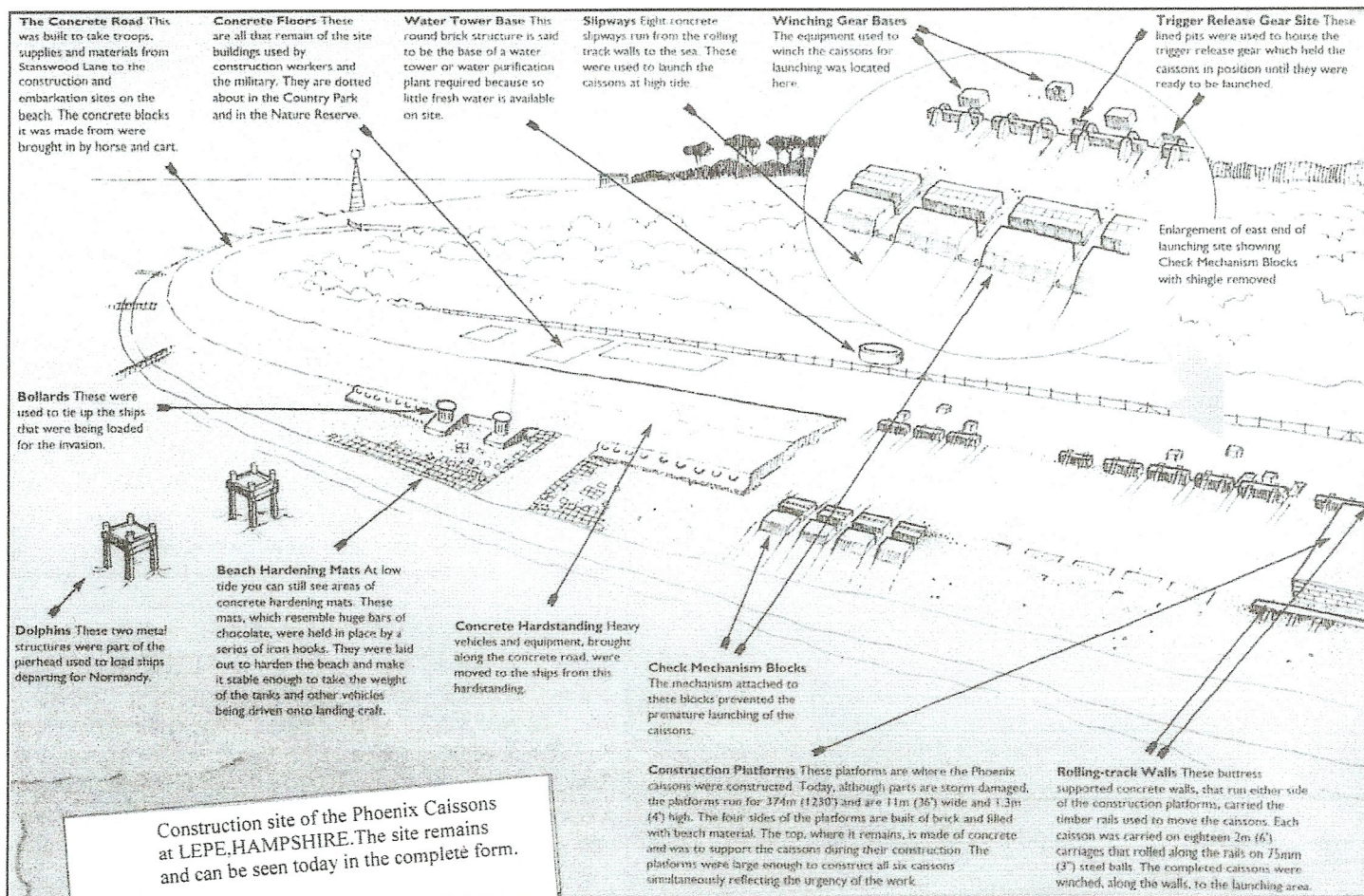


The Mulberry Harbour in World War Two made one of the greatest contributions to the successful supply of men, vehicles, tanks/ ammunition and food following the D-DAY landings at St. Laurent, Mulberry A on OMAHA BEACH and at Arromanches, Mulberry B on GOLD BEACH.

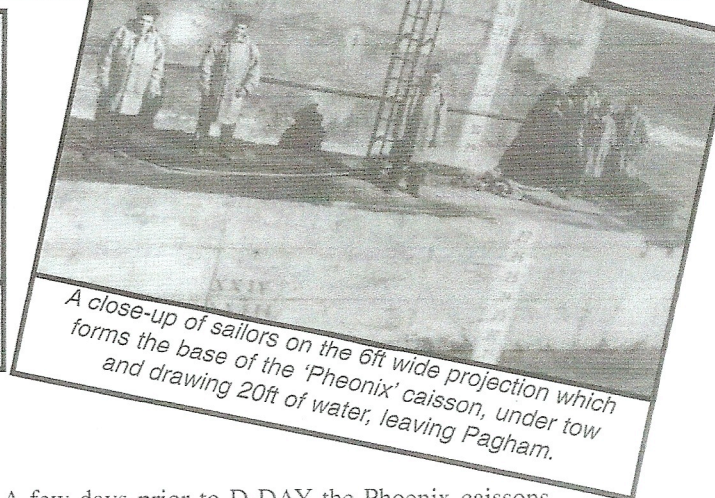


Partitioned sections of the 'Pheonix' caissons internally to a depth of 50ft/15.2 mtrs. When in position off Arromanches the sea valves were opened, sinking them on the seabed.

Mulberry Harbours consisted of a number of components, one of them being the Phoenix caissons. These were huge, floating, hollow concrete block structures, the largest weighing 6000 tonnes, 200ft/60m long by 50ft/15.2m wide and 60ft/18.2m high and drawing 20ft/6m of water. 147 of these Phoenix caissons were built in numerous locations along the South Coast and in the Thames Estuary. One of the construction locations was at Lepe in Hampshire.

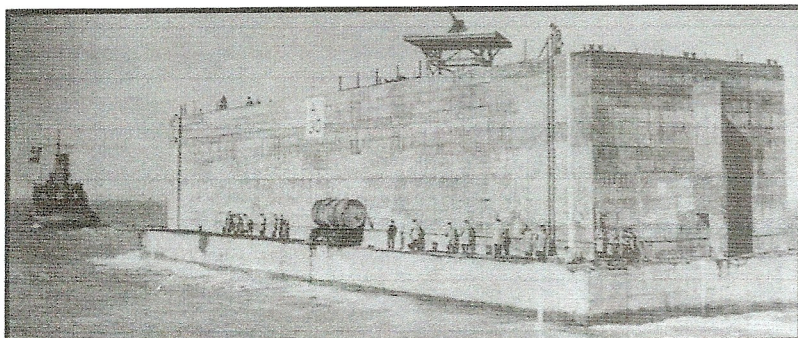


5th June 1944 'Phoenix' caissons and 'Spud' pontoon pierhead in the background off Pagham ready to leave next day for Arromanches.



A close-up of sailors on the 6ft wide projection which forms the base of the 'Phoenix' caisson, under tow and drawing 20ft of water, leaving Pagham.

Forty Eight of the Phoenix Caissons were towed to the offshore location between Pagham and Selsey and sunk. This was a wise move because we were still being troubled by marauding German aircraft. This was a combined operation made up of Royal Engineers, Royal Navy and the Admiralty Ferry Service. Also at Selsey was a contingent of US Navy Seabees who were responsible for the Phoenix Caissons for Mulberry A at St. Laurent, OMAHA beach.



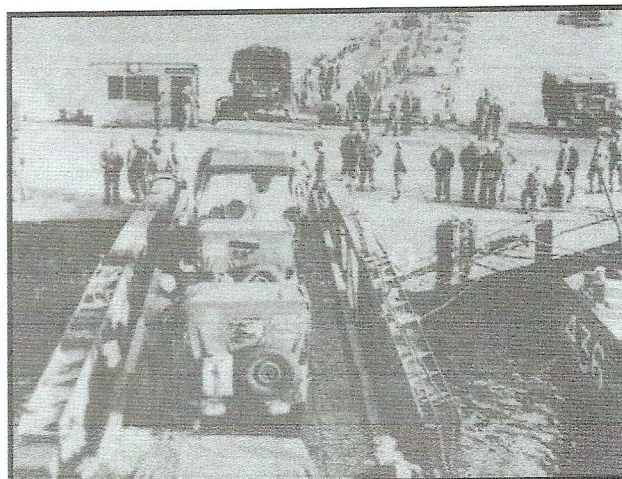
The first 'Phoenix' caissons off Pagham under tow to Arromanches, on the morning of 6th June 1944. Note the Bofors A-A gun on the platform.

A few days prior to D-DAY the Phoenix caissons were pumped out, floated and towed by ocean-going tugs to Arromanches and St. Laurent. On arrival at these locations they were sunk in line, forming the outer wall of the Mulberry Harbour. Inside the harbour, steel pier-heads with floating platforms and spud legs at each corner were lowered onto the seabed allowing the platform to move up and down with the tide. The total length of the 7 pier heads was 2300ft/700m. They were linked to the shore by floating roadways made of small concrete pontoons united by metal bridges and their total length was 4000ft/1200m.

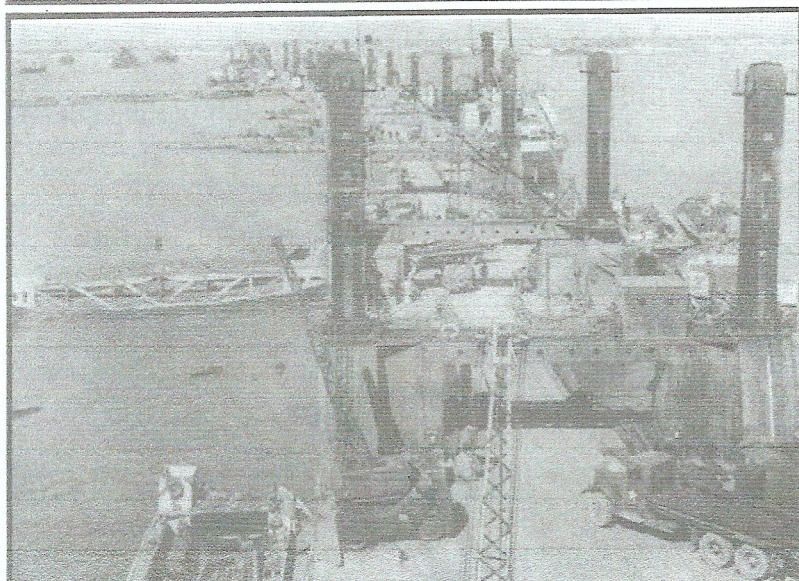
The ships would unload at the pier heads and lorries would transport ammunition, food and various goods on the floating roadway to the shore. Sometimes there were up to forty ships unloading at the same time in the Mulberry Harbour. By the 12th of June, just six days after the landings, 326,000 men had been put ashore, as well as



The inside of the harbour protected by the sunken 'Phoenix' caissons. In the background is the outer wall of the sunken caissons forming an entrance to the harbour.



Vehicles leave a ship alongside the pier head and travel to shore on the floating roadway.



Pier head with the floating platforms and corner 'Spuds' allowing the pier head to move up and down with the tide. Note the ship alongside, the lorry and crane in foreground and the floating roadway which links the pier head to the land.



This photo shows the floating pontoons with the steel bridges joined to each pontoon. These bridges were designed so that in rough weather they could move up and down with the wave motion.

54,000 vehicles of all types from Jeeps to kitchens and tanks weighing 40 tons in addition to 110,000 tons of various other items - food, medical supplies and ammunition, etc. As recognition of its success, the Mulberry Harbour was renamed 'Port Winston' in late June 1944 because it was the Prime Minister, Winston Churchill, who was the originator of the idea to transport a harbour across the English Channel to France.

Photos Courtesy of Imperial War Museum



In June 1999, Veterans of Combined Operations and the principals of the D-Day Museum Shoreham decided that there should be a memorial to mark Pagham's vital role in the D-Day landings. Philip Hawes approached the Environment Agency to provide a two and a half ton Norwegian rock; this was kindly donated and delivered to Pagham seafront opposite the Beach Road.



July 1999 and Vicar of Pagham, Rev. John Maynard dedicates the memorial rock and plaque to all who took part in the combined operation enabling the 'Phoenix' caissons to be towed to France. At low tide the memorial is in direct line with a 'Phoenix' which broke its moorings and sank offshore, where it remains today.

CODE NAME - "MULBERRY"

The success of any armed invasion depends on the supply of war materials for the attacking force being available at the right time and in the right quantity. No ammo - no war!

The lessons learned from the Dieppe Raid showed that any major port on the European mainland would be vigorously defended by the German forces, and would be destroyed by the departing enemy.

The planners of the D-Day landing had reckoned on a three-division initial assault, of 50,000-plus, men, building to ten divisions by D-Day+5, followed by a further division each day. Some 10,000 tons of materials would be required on D-Day+3, 15,000 tons on D-Day+12, and 18,000 tons on D-Day+18. With the appointment of General Montgomery as Tactical Commander of Allied Forces, the initial assault was strengthened by two more divisions; adding to the supply problems for the planners.

A suitable stretch of the French coast was chosen early on by the planners, who were under the Command of the Chief of Staff, Supreme Allied Commander (COSSAC), Lieut.-General F. E. Morgan. The Normandy coastline was not without its problems; the beach shelves slowly and there is a large rise and fall in the fast running tide. Large ships would have to anchor up to five miles from the beach, creating long and hazardous supply lines. A further hazard was the unpredictable weather in the English Channel during the early summer. Some form of sheltered water was necessary - but how?

Mulberry was the eventual answer, but, how did it come about? Unfortunately, its origin is shrouded in the mists of time. Twenty-six years earlier, Churchill had apparently proposed the use of concrete caissons to form an artificial harbour to be towed as part of a plan to capture the Frisian Islands of Borkum and Sylt in the Great War - the opportunity did not arise! The puzzle is, why did he not revive the idea in the 1940s, but there is his celebrated memo of May 30th, 1942: "Piers for the use on beaches...", a copy is on display in the exhibition. Eisenhower attributes the idea of taking a port to France to Admiral Mountbatten. Mountbatten in his biography attributes the original idea of sinking blockships to form a harbour to Vice-Admiral Hughes-Hallet at a conference in 1943. Then we have Hughes-Hallet saying the original concept came from an engineer called Guy Maunsel, who showed him plans for an artificial harbour in 1940. There was also a committee set up in 1941, which was led by Capt. Hussey to investigate the problem of sinking ships to compose a harbour. The truth is anyone's guess...!

Mulberry Harbour owes its success to British design, ingenuity and manufacture. There were many eminent engineers involved, both civilian and military. Many well-known engineering and building firms, and shipyards all over the country, were involved in its making. Two harbours were built: Mulberry "A" for the Americans at St Laurent; Mulberry "B" at Arromanches for the British.

Each Mulberry Harbour had an outer seaward defence line of floating hollow steel cross shaped structures (Bombadons). The main line of defence was composed of sunken blockships (Gooseberries), reinforced by sunken concrete caissons (Phoenixes), creating enclosed sheltered water for the unloading operation. Then there were the pierheads (Whales), composed of a number of piers and pontoons connected together. Each pier was a massive steel construction supported on four steel legs, called spuds, which were 89ft. long and 4ft. square, on which the pier would be raised or

lowered according to the height of the tide. The piers were connected to the shore by a floating roadway that could be lengthened or shortened with the rise and fall of the tide. Finally, there was a light floating roadway (Swiss Roll), which was invented by Ronald Hamilton, an engineer with an original mind for invention. Unfortunately, Swiss Roll failed to survive the storm. Discharge of cargo was carried out by all manner of craft. The Rhino ferries; designed by the Americans, were made up of pontoons strung together and powered by outboard motors; they were able to carry large quantities of vehicles and stores. The ubiquitous DUKW's; looking like barges were driven by propeller in water or by wheels on land: they were worked to destruction.

The Bombadons were designed by Lieut.-Commander Lochner RNVR following a series of observations and experiments he carried out in his trout pond at Hammer in West Sussex. The Bombadons were anchored together in two lines of 24 units 800ft. apart and were designed to reduce the initial energy of the incoming waves to one tenth of their original energy. They were made of mild steel plate bolted together in the shape of a hollow cross with watertight compartments. Each unit was 200ft. long, 25ft. high, with a beam of 25ft. and a draught of 19ft. A formidable obstacle!

To form the main breakwater, old warships and cargo vessels (Gooseberries) were filled with concrete, and explosive charges were placed strategically to achieve accurate and fast sinking into position. At the time of the sinking the German shore batteries claimed success and were amazed how accurate their fire had been in sinking so many ships in such a short time. The caissons (Phoenixes) were then placed in position and sunk, completing the breakwater.

The caisson story is one of high drama at times, and one in which Selsey played a major role. The caissons were gigantic, and one observer seeing them parked in Selsey Bay described the scene: "As if someone had picked up Chicago and placed it down on the Sussex shore"

Each unit was like a large box divided into compartments, and made of steel reinforced concrete. They had valves fitted to allow controlled flooding of each compartment so that these unstable structures would sink without toppling over and be lost forever. They were built in six different sizes to allow for the varying depth of the seabed. The largest A1 unit was 60ft. high, 240ft. long, and 56ft. in breadth at the water-line. They weighed 6,044 tons, giving a draught of 20ft. Some 212 units were built in docks all over the country. Most were built in the Thames area; others were built in Bromsborough, Middlesborough, Portsmouth, Southampton, Stokes Bay and Langstone Harbour. It was remarkable that such a large number were built in so short a time; a matter of nine months - especially with the shortage of men and materials at the time.

As each caisson was completed it was towed to a parking site. Some went to Dungeness as part of the operation "Fortitude" deception plan, which was designed to fool the Germans into believing the invasion would be made in the Pas de Calais area. The bulk of the caissons were delivered to Selsey where they were taken over by the American 108 Construction Battalion (Seabees); they were billeted or tented in the Park Lane area. It was their job to sink them until they were needed - the Navy was short of mooring space owing to the build-up of the invasion fleet around the south coast. The Seabees final job was to provision the caissons when they were re-floated, ready for action.

The Royal Engineers 969 Port and Construction Company, was also involved with this operation, and billeted in the East Beach area. The plan was to re-float the caissons at regular intervals, ready to be towed to Normandy; it was the RE's job to carry out the pumping operation.

There was a decided lack of American confidence in the pumping ability of the RE's equipment to refloat the caissons in such a short time, this brought an American salvage expert to the beach at Selsey. Capt. Elsberg USN was sent on a clandestine mission to get the facts. Elsberg took a look at the situation, persuaded the RE's to let him see the pumps and promptly decided the American fears were well founded. Again, he persuaded the RE's to attempt to refloat a caisson, which ended in failure. A similar attempt by the Seabees with larger pumping equipment also failed. He then realised that mud suction was playing a part and promptly set about applying hoses under the caisson to break the suction. The caisson then rose majestically from the sea, and was quickly returned before the RE's were aware of the success.

Capt. Elsberg describes in his book *The Far Shore* how his report on "The situation at Selsey" led to his superior, Admiral Stark getting in touch with an old shipmate from WWI, then Prince George, now the King, saying how worried he was with the situation at Selsey, so close to D-Day. The King must have spoken to Churchill, because Elsberg describes how "A cavalcade of cars preceded by noisy motorcycle outriders which ground to a halt at NOIC's (Naval Officer in Charge) office on the beach. Out stepped Winston Churchill, cane in hand, cigar in mouth, Homburg on his head. He took one look at Selsey and strode off eastwards in the direction of the sunken caissons, with the entire entourage stumbling behind. They plodded for about a mile on the sand. After a number of pauses he stopped, turned westwards and made his way back to NOIC's hut where he entered the small room with his initials on it. Now relieved, he got into his car and without a word sped off up the country lane towards the Chichester Road".

The next day, Capt. Elsberg learned that the British Navy, under Capt. Pollard RN, had taken over from the Royal Engineers! In no time pumping equipment was brought to Selsey from all over the country, thus ensuring the successful refloating and delivery on schedule of the caissons to Normandy.

Later, Rear-Admiral Hickling, NOIC of Mulberry "B" described in his lecture to The Royal United Services Institute in August 1945: "The building of the Harbour went well for the first few days, the Gooseberries being finished on D+5. By D+8 the Bombadons had been finished - giving good results with wave suppression of about 40 per cent. By D+10 the Mulberry Breakwaters were about half completed, and the Whale piers about a third. At about 3.30 on Monday night, 19th June (D+13), it started to blow and it blew for three days and three nights. The worst summer gale from the North in about eighty years. Had it not been for the Gooseberries and half completed Mulberries, I think the Allied Armada would have suffered the same fate as the Spanish. So much hung from such a slender thread".

The gale destroyed the American Mulberry "A" almost completely. At Mulberry "B" a certain amount of damage was done. But, by D+30 it was completely discharging an average of 9,000 tons daily; 2,000 tons more than the Harbour was designed for.

Was Mulberry a success, and was it justified? Ask the troops who were supplied through Mulberry with the wherewithal to breach the enemy's Atlantic Wall and helped to sustain the breakthrough to eventual - Victory!

It was brilliantly conceived, designed, engineered and built by the British. It was no mean engineering feat, which ever way you look at it.