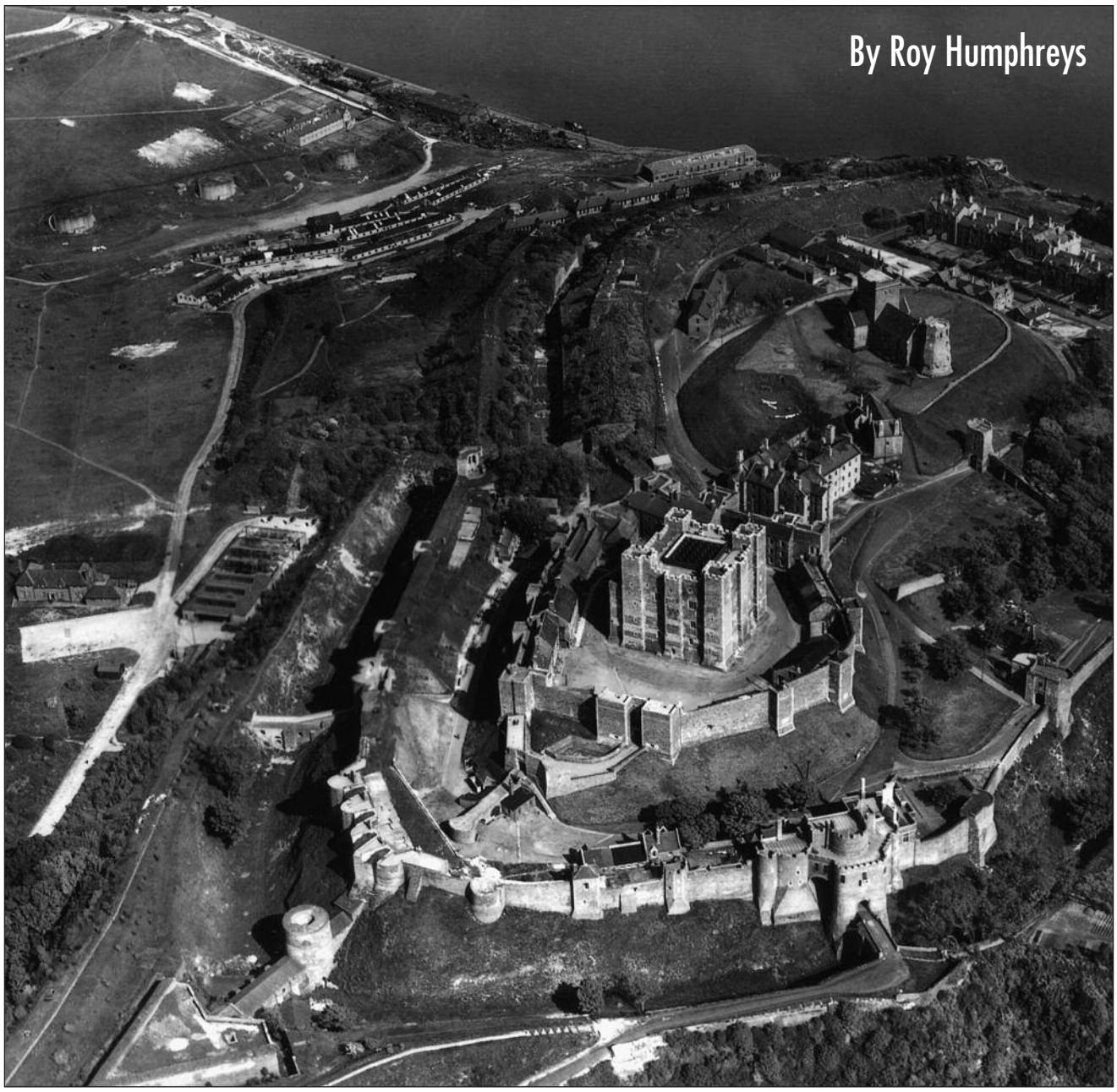
THE TUNNELS OF DOVER CASTLE

By Roy Humphreys



The medieval Dover Castle on the white cliffs facing the Channel hides a labyrinth of tunnels, underground passages and vaults beneath its rock-solid facade. In the left background three dummy oil tanks from World War II (Simmonds Aerofilms).

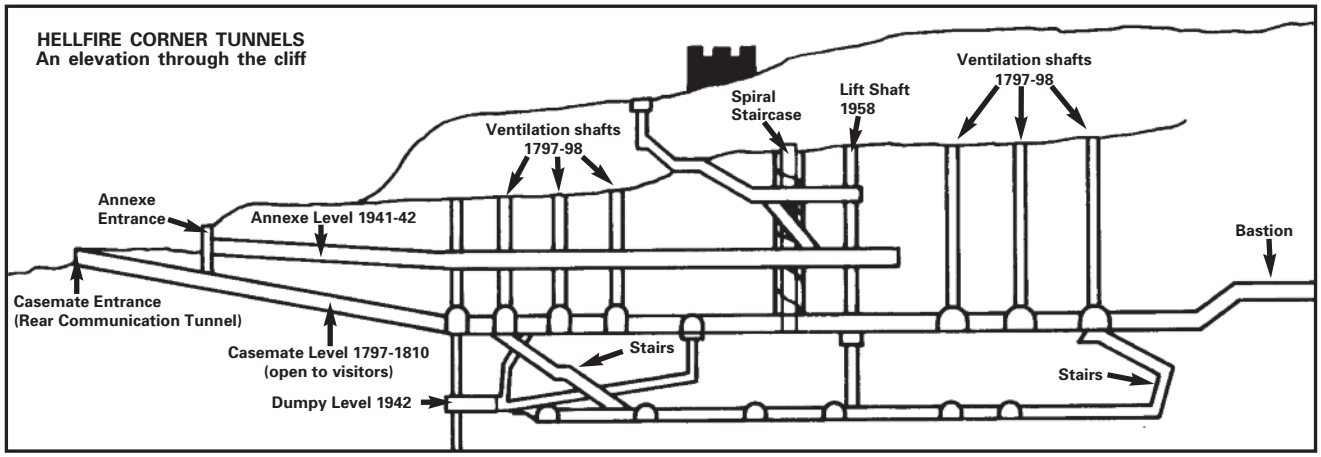
For a thousand years, a fortification has stood on the white cliffs at Dover overlooking the English Channel as a first line of defence against the foreign invader. From early Roman days and subsequently over 900 years, every new phase of Britain in the making has left its mark upon the castle.

It was during the Napoleonic Wars, between 1793 and 1815, that miners first began burrowing into the chalk cliff on which 'The Key of England' majestically sits. Simultaneously with the addition of barracks, gun batteries, moats and the paraphernalia of war that were being built to the west of Dover, seven tunnels (or casemates), were being driven inwards from the cliff face within the castle boundary. The chalk strata, a soft white limestone deposit, the origins of which date to about 100 million years, is easy to work and relatively safe to excavate, a fact not lost on military engineers, who began their onerous task of hand-digging these tunnels from the south-eastern cliff face in about 1797.

It was from here in 1940 — in what became famously known as the Admiralty Casemate nearly 60 metres below ground level — that Vice-Admiral Bertram Ramsay, Flag Officer Dover, secretly masterminded the evacuation of over 300,000 British and Allied troops from the beaches of Dunkirk.

Because of its close proximity to France, Dover has always been a likely target for any invading army seeking to establish a foothold on English soil and anxious to secure a sheltered harbour. The efforts to prevent this happening was never greater than during the Revolutionary and Napoleonic Wars when the government of the day poured money into fortifying both the town and port. Gun batteries were installed at sea level, just below the castle, and the defences of the castle itself were modernised.

Military engineers tunnelled into the cliff face, midway between the lower gun batteries and those situated on the cliff top and within the castle grounds. Two groups of three parallel tunnels ran in from the cliff face, substantial in size and brick-lined, creating the first underground barracks of this kind in Britain. Guns were to be emplaced at the seaward end of the tunnels while vertical ventilation shafts were cut at the inland end to disperse gun smoke. Access to these tunnels, later known as casemates, was served by a smaller, unlined communication passage

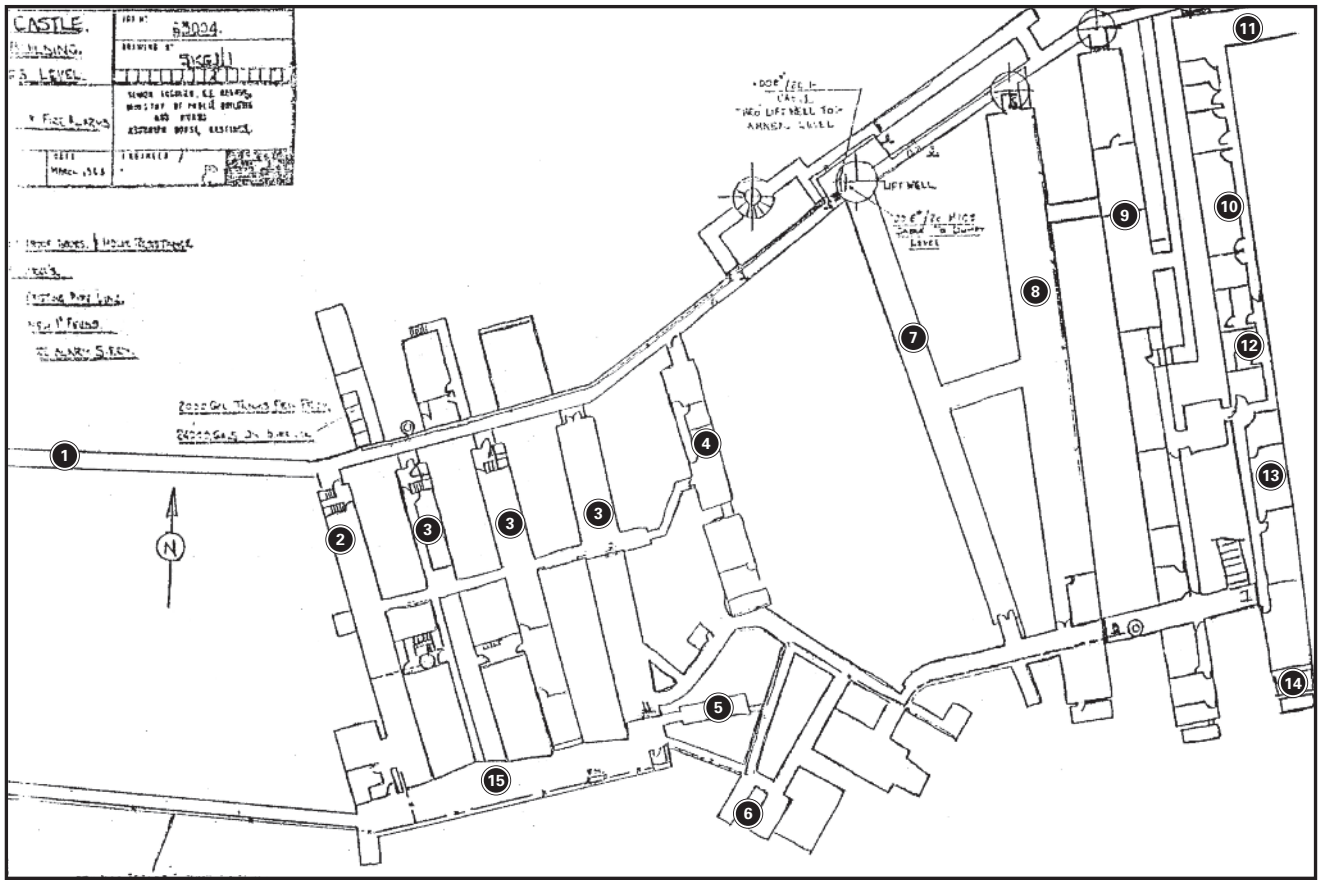


The castle had been built for King Henry II in the 12th century but it was the threat from Napoleon 600 years later which prompted the construction of extensive fortifications to defend Dover against a possible invasion by France. British military engineers already had experience of building tunnels in Gibraltar (see *After the Battle* No. 21) so a decision was made to construct underground facilities beneath the castle for accommodation of the garrison, gun crews and stores. Tunnelling began in 1797 at what is termed Casemate level, seven tunnels being completed by 1810. Additional layers of tunnels were added during the Second World War: Bastion level (1941), Annexe level (1941-42) and Dumpy (1942).

which linked each of them at the rear. Near the southern or seaward end of the eastern-most tunnel — later to become the Admiralty Casemate in WWII — a second communication passage was cut behind the cliff face linking the eastern group to an open area in front of the three western tunnels. Known as 'The Terrace', at its western end a brick-faced tunnel gradually sloped upwards to ground level to provide an access route for moving heavy guns and associated equipment into the casemates.

However, by the time these tunnels were finished in about 1810, the threat of invasion had largely diminished, and it appears that the guns were never mounted during the remainder of the Napoleonic War. Instead the tunnels and passages were maintained after Napoleon's defeat at Waterloo so that when the First World War broke out in 1914 they were available, albeit for less exciting storage purposes. The signal station for the Dover Patrol was situated above on the cliff face.

It was during the Second World War period, with enemy-occupied territory now only 21 miles away, that the underground Napoleonic complex came into its own. Vice-Admiral Ramsay and his naval staff moved in to occupy the eastern casemate in 1939 where he created the first operations room. A telegraph operator, Charles Seyd, who arrived just one week before war began, recalled receiving a signal from the Admiralty on September 3, 1939 'to fuse all warheads — prepare for war'.



When the Second World War began Vice-Admiral Bertram Ramsay was appointed Flag Officer Dover. As he had served in the Dover Patrol in the First World War he was very familiar with the defences of the port and, because of the new threat from aerial bombing, he established his headquarters in the eastern-most section of the Napoleonic Casemate tunnel complex. [1] Entrance. [2] Canteen. [3] Dormitories and offices. [4] Cypher Office. [5] Emergency generator. [6] Latrines. [7] Telephone Exchange (1941). [8] Exchange (1939-41). [9] Exchange (post-1941), AA and Coastal Operations Room. [10] Admiralty offices. [11] Naval Cypher Office. [12] Operations Room for Operation 'Dynamo'. [13] Admiral's staff. [14] Admiral's Cabin. [15] Balcony.

Based at the Royal Engineers supply depot at Canterbury, Sergeant Thomas Groves was responsible for supplying corrugated steel sheet and its upright supports to various tunnelling companies working in South Eastern Command. He was on permanent attachment to Dover Castle, arranging supplies directly to detachments of Nos. 171, 172 and 173 Tunnelling Companies, RE, who were busy cutting through chalk immediately above and behind the original Napoleonic casemates. This new section became known as 'Annexe' and was being built to house a dressing station, dormitories, kitchens and messing facilities. The dressing station was later extended to a 500-bed hospital with two operating theatres. One detachment from No. 172 Tunnelling Company had recently been working in Gibraltar (see *After the Battle* No. 21) where they had been engaged cutting through solid rock but they said tunnelling through chalk was a piece of cake.

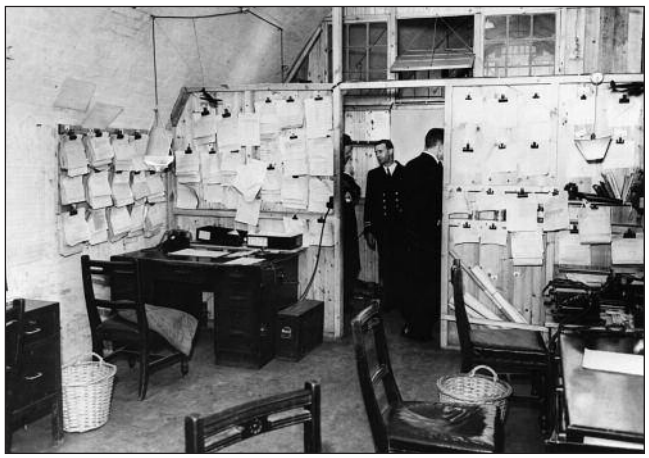
The defence of the castle in 1940 was both bizarre and medieval in concept. Private Pearce, serving with the 15th Battalion Queen's Royal Regiment, recalled the chalk passages were stacked with obsolete 40lb RAF bombs. Elsewhere were stored a number of wooden frames approximately 12 feet long, supported on legs which were about 18 inches high. These frames consisted of two solid wooden planks about six inches wide, and they were fixed to the legs to form a V-shaped channel, rather like a narrow trough. In the event of an invasion they were be strategically placed along the cliff top for the purpose of directing the bombs onto the heads of the enemy at the foot of the cliff!

After the Dunkirk evacuation, the nerve centre for the Channel coastal artillery (see *After the Battle* No. 29) moved in from Fort Burgoyne and by 1941 over 4,000 gunners were being controlled from this point. The operations staff occupied a small room known as the 'Movements Room' where the positions of enemy shipping were plotted, and also Allied vessels to avoid shelling them by mistake.

Interceptions, battles and skirmishes, between a variety of German warships, Royal Navy MTBs and MGBs, coupled with enemy long-range artillery shelling shore installations and shipping in the Dover Strait, was monitored by staff working a three-shift system. Information was received, both day and night, from coastal observation posts, RAF reconnaissance pilots, warships and radar stations.

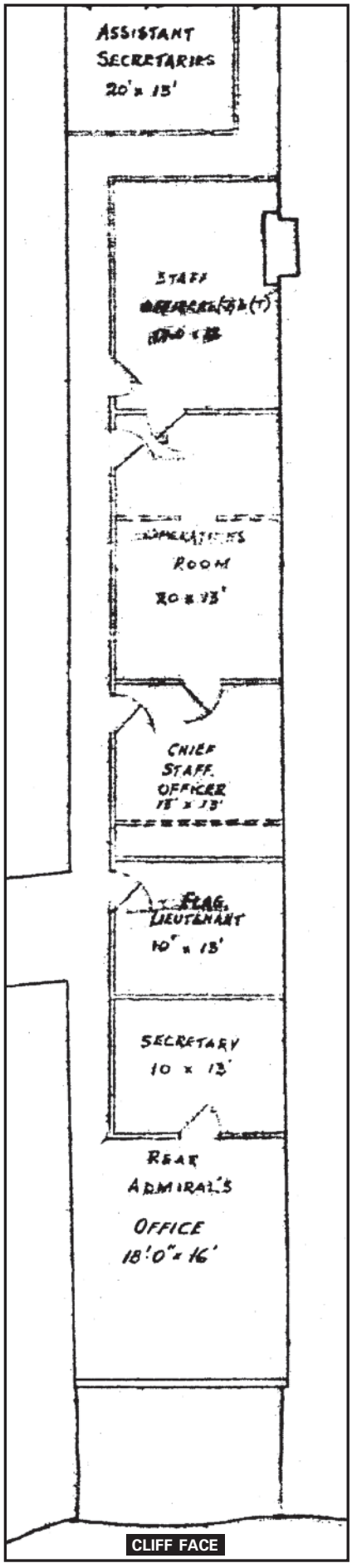
As the war effort expanded, so the tunnels became crammed with communication equipment and the people using it so a decision was taken in early 1941 to extend the tunnels slightly above and to the rear of the eastern Admiralty Casemate. Additional

Typical rather crude office accommodation in the high-vaulted Casemate level tunnels. Although there is no question that these pictures are genuine Admiralty photos taken in Casemate level, the original caption is somewhat of an enigma as it states: 'Staff Room, Dover Castle for film set reconstruction'. (IWM)



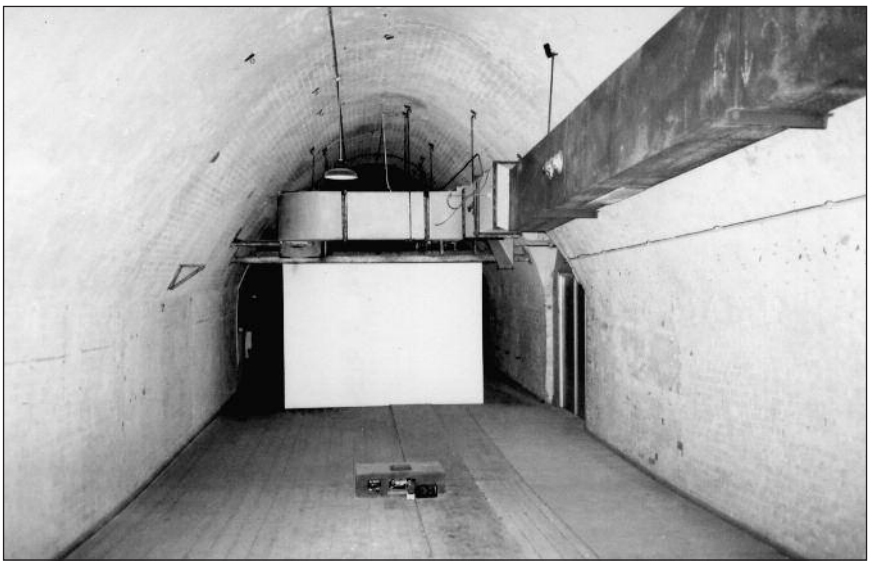
These two photographs are part of the same series so they may show the other end of the same room as the corridor — the vertical wood boarding on the right, is on the correct side.

As we can see daylight above the end partition in the picture on the left, most probably this is the office to the rear of the Vice-Admiral's cabin (see overleaf). (IWM)



The office layout in March 1939.

Vice-Admiral Ramsay's cabin was at the extreme southern end of the easternmost tunnel of Casemate level where he could enjoy the view over Dover harbour. (IWM)



Today Casemate Tunnel has been stripped bare of its wartime office partitioning, the air conditioning having been installed during the Cold War period to provide ventilation for Dumpy level which was converted into a bomb-proof Regional Seat of Government as a preparation for a possible nuclear war.

Right: **Bertram Ramsay joined the Royal Navy in 1898 and commanded *M.25* and HMS *Broke* in the Dover Patrol from 1915 to 1919. His inter-war commands included HMS *Weymouth* (1924-25), HMS *Danae* (1925-27), HMS *Kent* (1929-31) and HMS *Royal Sovereign* (1933-35). In 1935 he was promoted to Rear Admiral and, after having been appointed to a number of staff roles including Chief-of-Staff to the Commander of the Home Fleet, Sir Roger Backhouse, to Vice-Admiral in 1938. From 1939 to 1942 Ramsay was Flag Officer commanding Dover and as such was responsible for the evacuation of the British Expeditionary Force from Dunkirk — Operation 'Dynamo' — in 1940. In 1942 he was appointed Deputy Naval Commander-in-Chief to work with General Eisenhower on Operation 'Torch' — the landings in North Africa — and the following year was Naval Commander for the invasion of Sicily — Operation 'Husky' (see *After the Battle* No. 77). This led to his becoming the Allied Naval Commander-in-Chief for the D-Day landings (Operation 'Neptune') when he was promoted to Admiral. On January 2, 1945, Admiral Ramsay was killed when the aircraft he was travelling in crashed on take-off in France (see *After the Battle* No. 87). (IWM)**

Left: **Prime Minister Winston Churchill inspects maps at the plotting table in front of the window. In the second shot *(right)*, taken during Churchill's visit to Dover on August 28, 1940, we can see the corridor entrance to the cabin on the left. Brigadier C. W. Raw, the commander of XII Corps which included the coastal batteries in the area, stands on the right. (IWM)**

Unfortunately Admiral Ramsay's office was used for the huge air intake making meaningful comparisons difficult. Nevertheless this is where the Admiral was pictured with Churchill in 1940.

tunnellers were brought in to excavate a new level which was intended to accommodate a combined headquarters complex called 'Bastion'. It was an ambitious plan consisting of an upper floor, cut in a grid pattern, just behind and to the rear of the old Napoleonic casemates, and was intended not only to ease the pressure on space, but as a standby HQ should the operations centre at Portsmouth be put out of action.

To minimise disturbance of the existing facilities, a working tunnel was driven from above. At the same time a separate tunnel was started at the rear of the casemate level running almost parallel with the rear communication tunnel at the base of the spiral stairway, intending to link the new complex to the casemates.

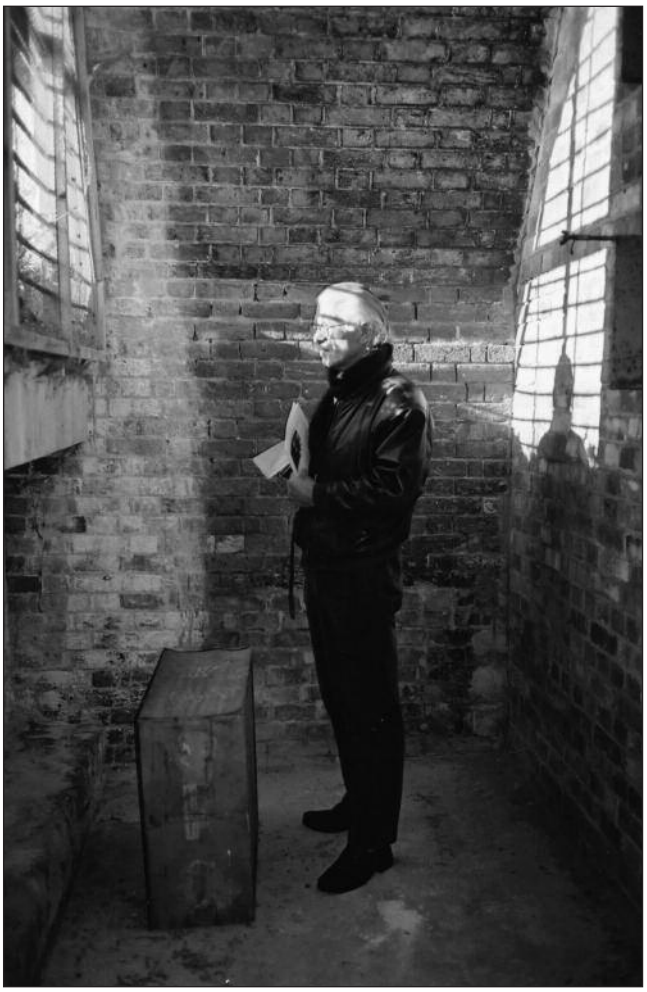
Work progressed and more than 50 per cent had been completed when severe subsidence occurred. Although the method of working was the same as that used in the mining industry, where the only unsupported area is the work face, it is thought that the problem was caused by the proposed central plotting room which had a large, unsupported ceiling in excess of the usual six-to-ten-feet roof span supported by chalk pillars. After consultation, further work on the Bastion was abandoned.

The only entrance had been through the construction tunnel through which all the chalk spoil was removed which exited through the cliff face. To prevent further subsidence, this entrance was cleared and the corrugated sheet lining removed. It was then back-filled and cemented over before a wall was built. An emergency flight of stairs at the back of the complex had already been cut through to within a few feet of the surface within the castle grounds when the work was suddenly stopped.

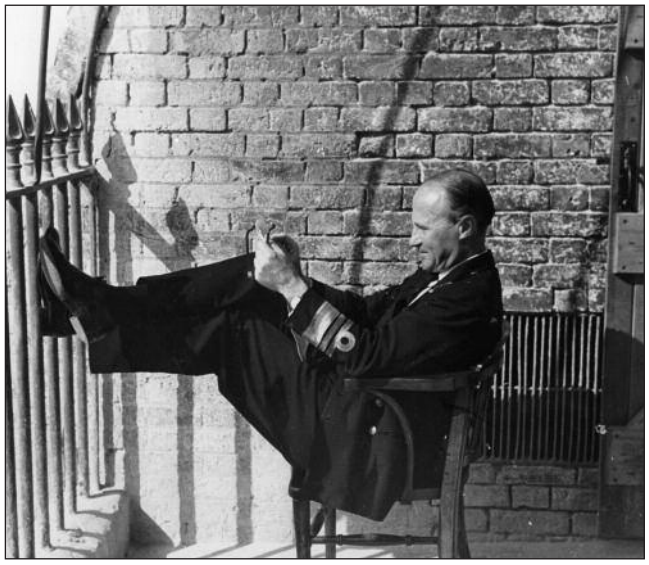
During tunnelling operations, several million cubic yards of spoil had to be disposed off, most of which was being dumped in the sea just off of the Eastern Mole but it showed up clearly on RAF reconnaissance photographs. This became the subject of a report signed by the Superintending Engineer on March 4, 1942, which stated that 'considerable difficulties . . . due to spoil exposure . . . ensure prompt action following completion to study long term camouflage policy'.

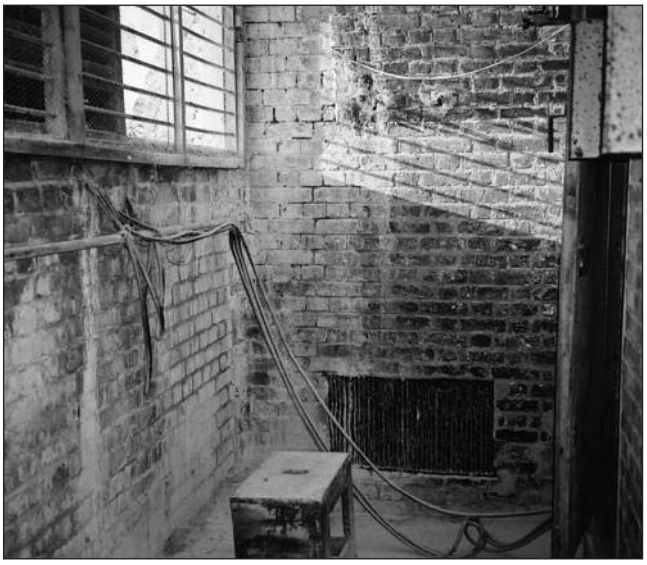
We are told that the PM was most reluctant to don a steel helmet, his 'John Bull' hat being his trademark along with the cigar. Two more changes of headgear are shown below. (IWM)

Above: **In June 1941, Churchill was pictured on the balcony outside accompanied by the Chief of the Imperial General Staff, General Sir John Dill. Note the Lewis gun mounted on the parapet behind Vice-Admiral Ramsay. (IWM)** *Below:* **Same balcony in October 1942. Now the Prime Minister is showing the view to the South African premier, Field-Marshal Jan Smuts; Sir Kingsley Wood, the Chancellor of the Exchequer, and others during a tour of the defences in the area. (IWM)**



When our Editor-in-Chief visited Dover he found that the parapet had been increased in height and an outer window installed.





Left: **Here the Admiral is relaxing on the balcony outside the adjacent tunnel which housed the AA and Coastal Operations Rooms (see [9] on the map on page 30).** *Right:* **The railings were later replaced by brickwork with a window above.**

In late 1942 cutting was re-commenced at a lower level beneath the casemates forming an area of tunnels, passages and rooms, which by 1943 became known as 'Dumpy'. The chalk strata in this location was easily cut into by Holman pneumatic picks connected by air-line to compressed air generator units situated outside in the moat area. The Dumpy complex of tunnels was in fact extended outwards from a former Napoleonic magazine reached through an old lift shaft. Occasional heavy rainfall would often penetrate the chalk and this remained a problem even after the corrugated sheet steel linings were erected. Seepage was directed into the extensive, and sometimes complicated, main drainage system.

Between 200 and 300 skilled tradesmen of No. 693 AW Company of the Royal Engineers consisting of carpenters, bricklayers, masons, plumbers, electricians and painters, followed on the heels of the tunnellers. Chalk spoil from the workface, where four mining sappers were cutting, was shovelled by pioneers into metal trucks running on the small-gauge railway system which led through a service tunnel to the edge of the cliff. There the trucks were tipped up sending the contents 60 feet onto an area where a couple of houses had been demolished at East Cliff. From there the spoil was shovelled onto a conveyer belt system which carried it to the Eastern Mole where it was dumped into the sea. Lighting at the chalk face was initially provided by a wandering-lead system until the more permanent lighting fixtures were installed by the electricians.

The Dumpy complex was eventually fitted out as a fully-equipped operational headquarters for the joint services. A Ruston & Hornsby power generator back-up system was installed along with an up-to-date air conditioning system installed by G. N. Haden of Trowbridge. Communication between the various offices was provided by the efficient, although dated, Lamson vacuum tube system, whereby messages were quickly transferred in cylindrical containers propelled by compressed air through three-inch diameter tubes.

Correspondence between the various commands early in 1942 reveals that 'there is a considerable amount of tunnelled accommodation in the castle other than that in the actual casemates' and that 'additional tunnelled accommodation at Dover is required so that staff may live underground under conditions of prolonged siege and constant bombing attacks to which this fortress may well be subjected. Even if the rest of Dover should be overrun by the enemy, the castle itself is a very strong defended locality which is intended to hold out independently and must therefore be self-contained.'

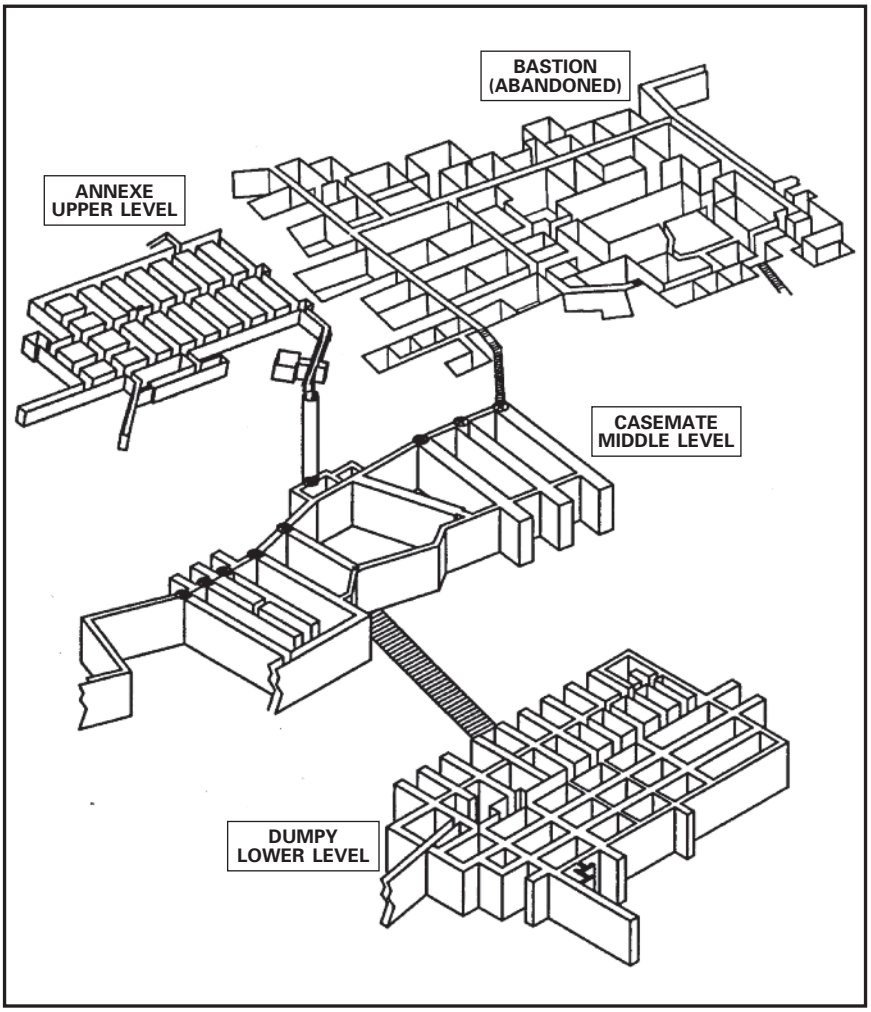
Churchill showed great interest in the lower level — the Dumpy Combined Services complex — nearing completion, which was to house the supplementary naval, army and RAF units. He was, however, amused to discover that the previous Flag Officer Dover had refused to vacate his office because, through his window in the casemate, he could observe the 'goings on' outside. Rosemary Keyes (Lord Keyes's niece), served as a WRN cipher officer and remembers the rabbit warren of dark, dreary, damp and airless passages and rooms. 'We worked all day in electric light and only saw daylight when we went to the "heads" to spend a penny. This was a small room which contained a noisome "thunderbox" and a beautiful view over Dover Harbour, seen through a small window cut into the cliff face, but only if you stood on the lavatory seat'.

The multitude of telephone cables which were eventually connected with Dumpy came from coastal gun sites, anti-aircraft sites, brigade headquarters, fortress plotting rooms, gun plotting rooms, airfields and air-sea rescue, not to mention the naval operations. It was a source of wonder to the uninitiated how the telephone engineers knew which wire was which when repairs were needed. Even more disconcerting was that the whole gamut tended to confuse the most intelligent of staff when no one was quite sure who was who, who worked where, and what their particular job was. Security became a nightmare. Military police of all three services were not only at the entrance to the castle, but also at the entrance to the tunnels, and armed guards were on sentry duty around the castle perimeter.

The incessant din created by the air compressors and picks, reverberating through the metal ventilation boxes, permeated every room, cubicle and passage throughout the casemates, as the tunnellers frantically cut through new chalk in an effort to finish their task on time.

The large terrace balcony ([15] on the map on page 30) is the one used for publicity shots like this one of Vera Lynn taken in May 1990 when she officially unveiled the opening of the tunnel complex to the public. She was pictured with several Dunkirk veterans, Roger Bellamy, Bernard Whiting and Les Tyler.

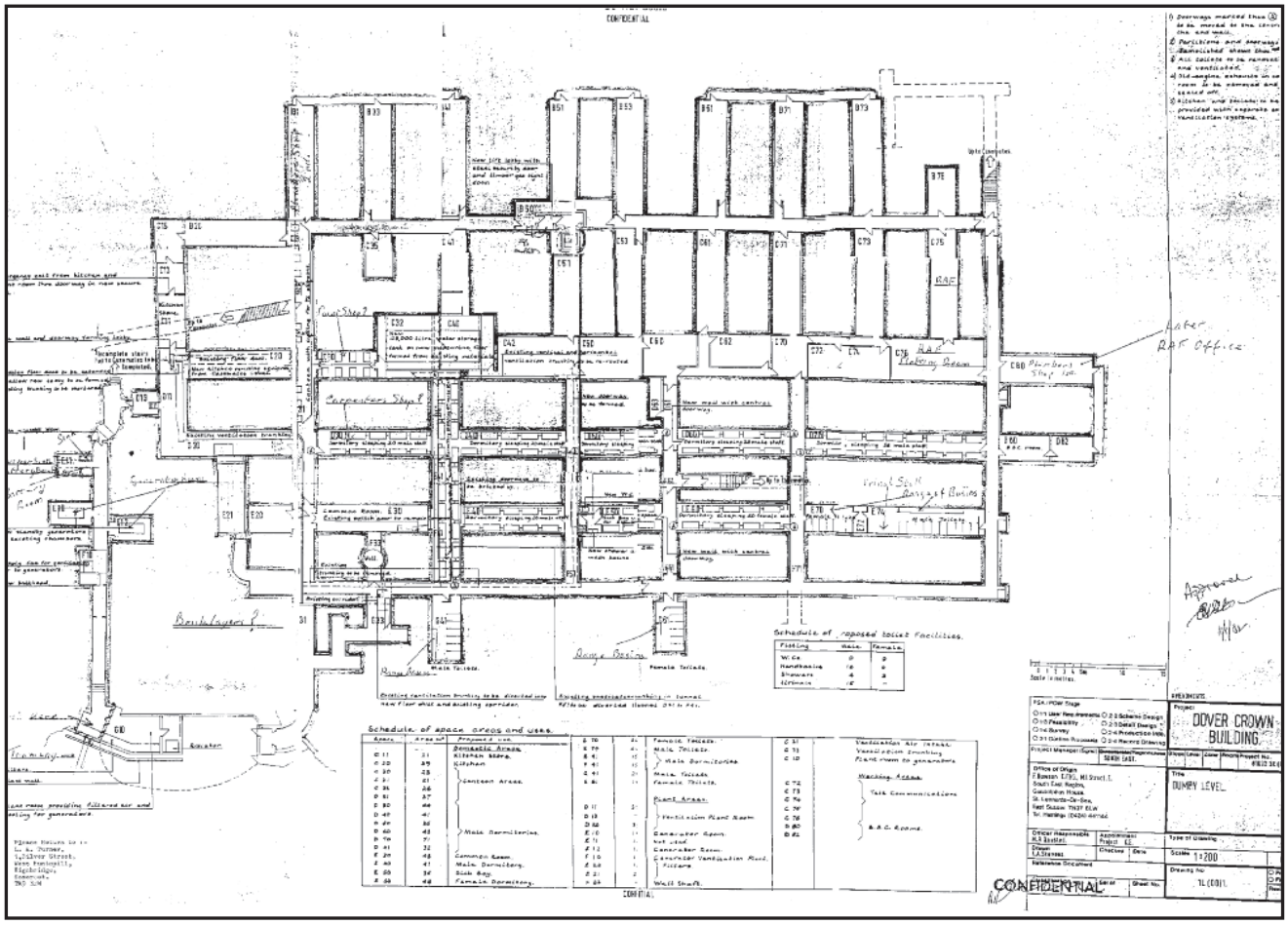
This isometric view — not to scale — shows the relationship of the three additional tunnel complexes dug during the Second World War. Bombardment of Dover from the German long-range heavy artillery in the Pas de Calais (see *After the Battle* No. 29), increased the need for sheltered accommodation at Dover, so what had been purely a naval station was enlarged to become a fully fledged tri-service headquarters. The first extension was the Annexe level, initially for medical facilities but later used for dormitaries, followed by Bastion intended for the new combined headquarters but which had to be abandoned when serious rock falls took place during its construction. In its place a new area was chosen beneath the Casemate level for Dumpy which, when completed in 1943, eventually did become the new combined headquarters.



In October 1942 an additional request was made for two subsidiary tunnelled dugouts for wireless transmitter stations located about a mile from the castle. The completion date for installation of power supplies to these two transmitter stations, one at Langdon Hole and another at the Danes, was required by the same date as the main complex of tunnels under the castle. The commander of No. 172 Tunnelling Company estimated that each new tunnel would take from six to eight weeks to complete but that he could not spare any men from the main tunnel complex (Dumpy) if it was to be completed any earlier. He further suggested that if the whole project was put back a month he would need about 60 extra tunnellers from the beginning of November for two months.

In December 1942, gas proofing of the Dover casemates was brought up for discussion but it was decided not to proceed with this proposal as it would mean cutting a new tunnel entrance and disturbing the Post Office equipment already installed which was in constant use.

Left: **Sappers removed only enough rock to enable each section of the steel shuttering to be put in place. The lightweight Holman pick was ideal for cutting into the chalk.** *Above:* **The spoil was dumped through the cliff face. (IWM)**



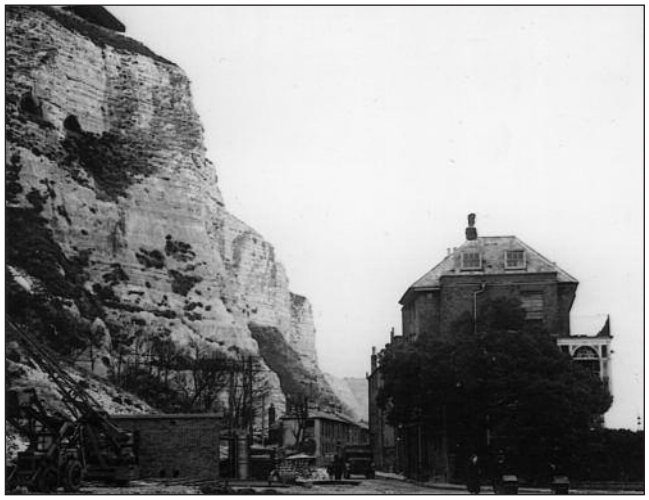
Dumpy — the new Combined Headquarters — was required for Operation 'Overlord' in case the main operations centre behind Portsmouth was put out of action, and to cater for the operational side of the three services. It was completed by 1943.

Ken Flint, Royal Signals, arrived at Dumpy in 1943. He recalls:

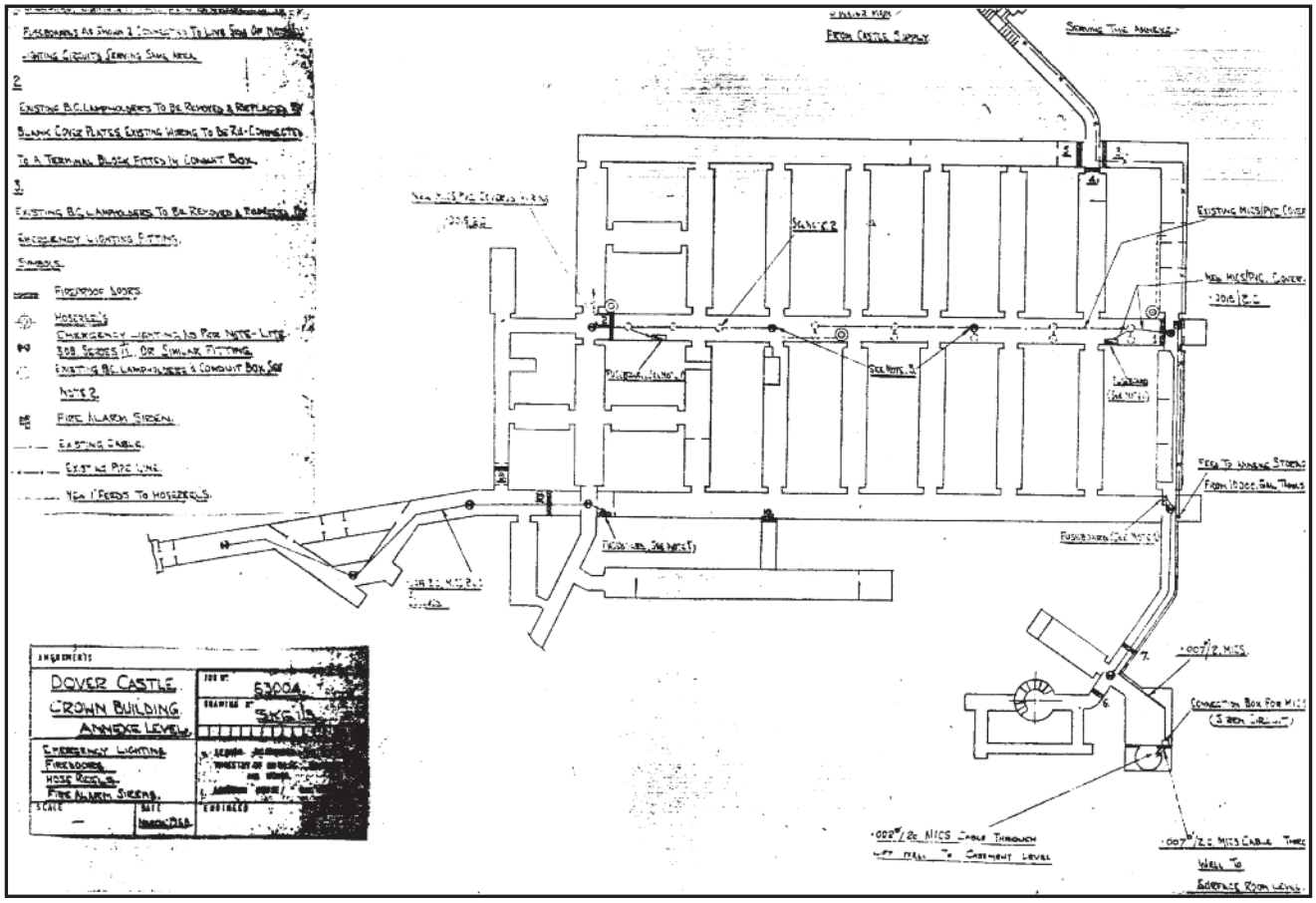
'We walked along rough-hewn greeny-grey passageways cut out of solid chalk. Occasionally the steady drip, drip of water not only permeated the ceilings but also our forage caps. The tunnels rambled gently downwards until we were at the top of a very steep flight of concrete steps, fortunately well lit and provided with a handrail of sorts. At the bottom was a maze of passages with fluorescent lights, festooned with pipes, cables and nozzles blowing out tangy salt air.

'It was in the small hours of one early morning in late 1943, whilst sitting with headphones on in front of the receiver concentrating on accurately recording the umpteenth of a never ending stream of five-letter cipher groups, that the door was suddenly flung open dramatically and three or four face-blackened and tommy-gun-armed commandos burst in. Their officer waved a pistol at us and ordered us to switch off and stop sending any more gen.

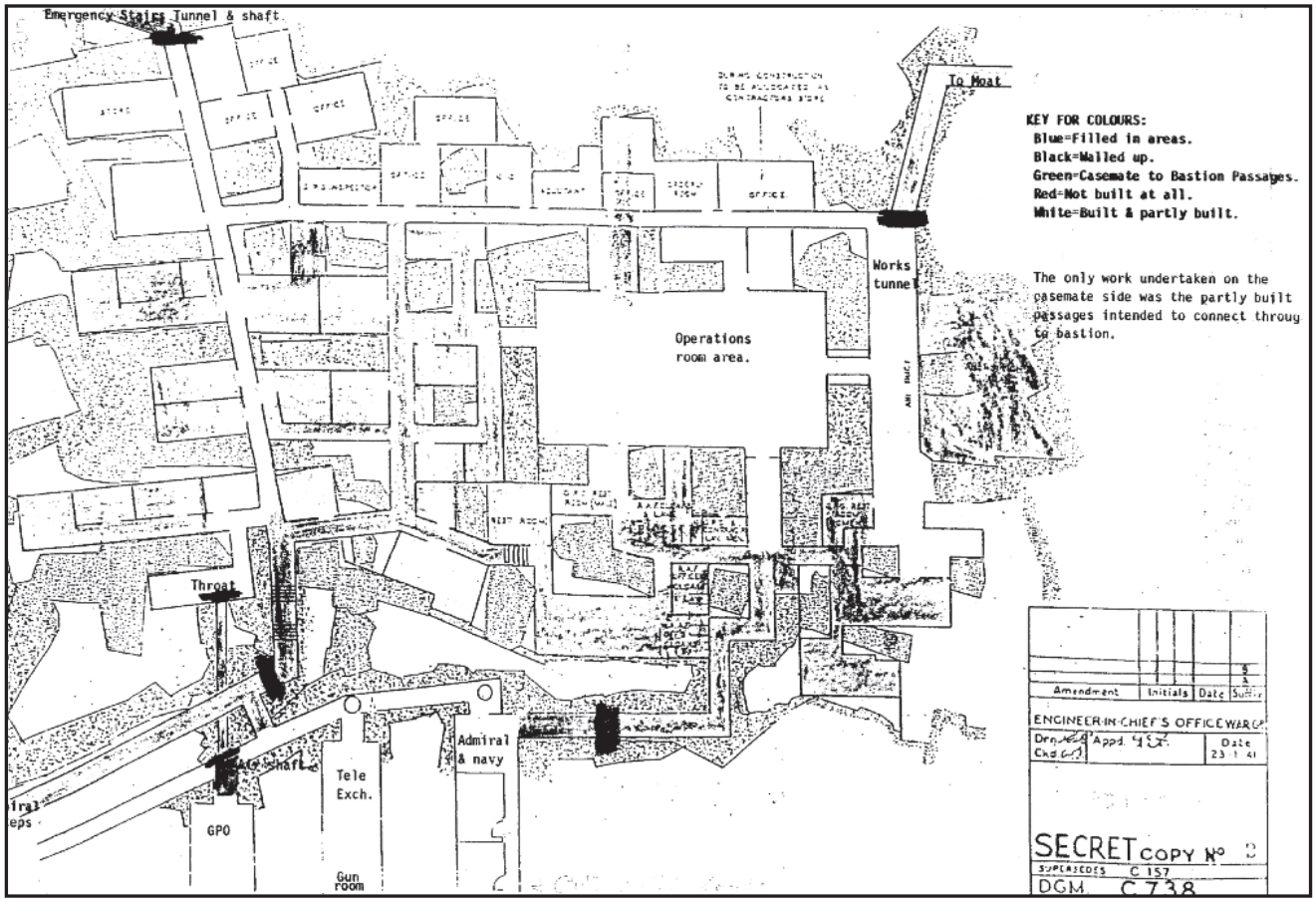
'At that hour in the morning, with one's brain addled with radio atmospherics and interference, we did as we were told and sat back in our chairs obediently. We later learned they rampaged through the whole of the Combined HQ but seemed unaware the army cipher room was at the end of our radio bay. Had they known about it they could have boasted of its capture. Naturally there was never any mention of this mock attack, made by commandos who had climbed the cliff face and entered the tunnels through a ventilation shaft. Rumour had it that the top brass had never considered the Germans would have gained entry by this difficult route.' The only casualty was a GPO technician working on wires in a small cubicle. A well aimed thunder-flash exploded close to him with deafening results.



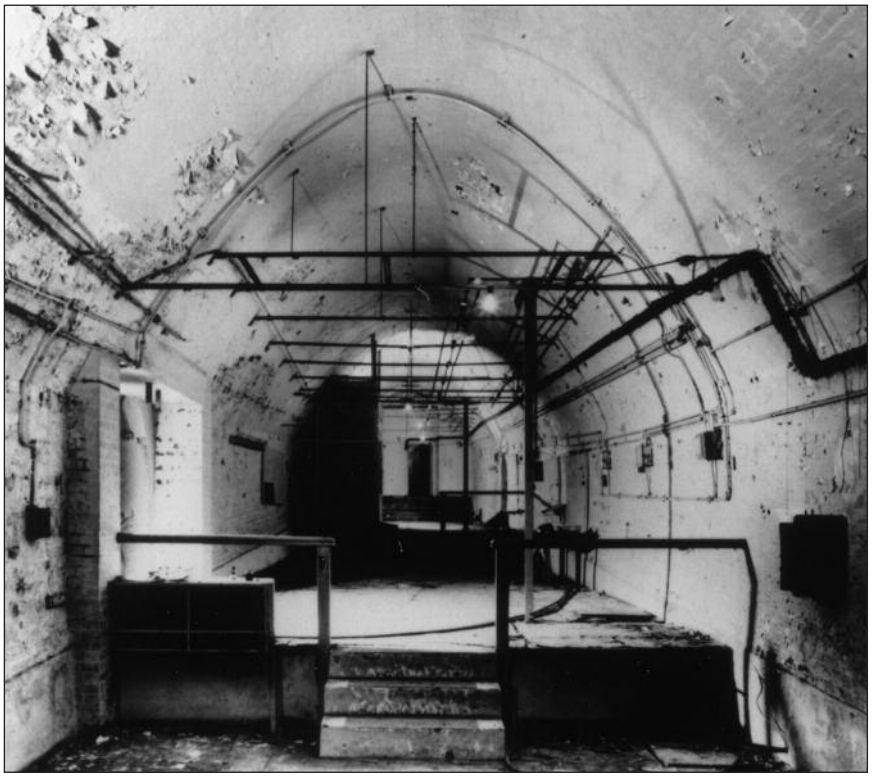
Left: **The security of the new HQ was tested by commandos who easily gained access by climbing the spoil heap on the left and entering Dumpy via one of the ventilation shafts. (Paul Wells)** *Right:* **East Cliff virtually unchanged 60 years later**



Annexe level which was excavated in 1941-42 was initially intended for use as a hospital but never used in that capacity. During the heavy shelling of Dover in 1944 it was converted into male and female dormitories.



This plan of the abandoned Bastion complex shows where the workings were sealed up — denoted by the heavy black lines.



In 1958 the Navy quit their underground headquarters and handed the complex over to the Home Office which was in the process of establishing Regional Seats of Government (RSG) which would operate as secure accommodation for government in time of a nuclear attack. Huge sums of money were spent in modernising the facilities in the westernmost tunnels of Casemate level with air filtration and new generators and including stockpiles of food, fuel and water. At the same time Admiral Ramsay's HQ in the three eastern tunnels was abandoned and all the equipment eventually removed.

After the Second World War just about everything moveable was cleared from the Casemate complex, Annexe and Dumpy. An eerie silence descended on the tunnels, broken only by the occasional exclamation of wonder from an occasional visitor. The fascination with Dover's tunnels is insatiable, perhaps centring on the gritty toil of the tunnellers or on the darkened abandoned vaults and chambers that were synonymous with the threat of war.

In the second half of the 20th century, the 'Cold War' between the Soviet bloc and the West initiated a new round of construction of a network of subterranean facilities which could withstand a nuclear attack. Bunkers, especially designed to protect both military nerve-centres and central and regional government, were built at huge cost and in great secrecy. Dover's tunnels became one of the locations chosen.

Following the Berlin crisis of 1948, improvements in the UK's air defence involved re-opening some of the WWII radar stations and even constructing new ones. It was primarily a quick solution to an otherwise thorny problem of providing an adequate radar system at a bearable cost. The inadequacies of wartime equipment called for a more up-to-date system which brought about the 'Rotor Scheme' developed jointly by the Air Staff and the Ministry of Supply during the 1950s. Even so, the first Rotor was seen as a poor substitute until more-powerful high-discrimination centimetric radar became available in late 1957.

Swingate's Chain Home site above Dover was overhauled and re-equipped, and to maintain the necessary high level of air coverage from Portland Bill to Flamborough Head, 28 Chain Home Extra Stations were restored, and 14 new Chain Early Warning (CEW) and Chain Home Extra Low (CHEL) stations, one of which was the St Margaret's station, were introduced.

Within the scope of the various reporting stations were the Anti-Aircraft Operations Rooms (AAORs), one of which used the Dumpy complex beneath Dover Castle. This unit was in immediate contact with the nearest Ground Control Intercept (GCI) at Sandwich and which in turn was in contact with the Sector Operations Centre (SOC) at Kelveden Hatch, Essex. The visible evidence of a Rotor station being built was all too obvious to any casual observer as huge excavations were necessary before any construction work was undertaken.

The AAOR beneath Dover Castle, although built to a standard design, did not call for a massive rebuild other than the installation of blast-proof steel doors at the entrances and exits, with steel plates protecting the grills over the ventilation shafts. Inside, the usual two-storey operations room was overlooked by a balcony on three sides, fitted with curved perspex glazing that gave an unobstructive view of the plotting table below. Corridors around the outside of the operations room gave access to the offices and cubicles; below was housed the generator unit providing emergency electrical power, and next to it was the forced-air ventilation room. The Dumpy AAOR was abandoned after the demise of Anti-Aircraft Command in 1955.

Later Dumpy was re-instated to form one of the Regional Seats of Government (RSGs) to be manned in the event of nuclear war. The whole complex was reactivated but on a much larger scale and with more modern equipment. Included was a complete BBC studio whose signals would use the underground cable systems still connected to the two original transmitters outside the castle. Although it was hidden behind a veil of anonymity, the Regional Seat of Government at Dover Castle was no more secret to the local populace than was their involvement with the Civil Defence Corps. Men and women, family and friends, not only knew of its existence but allowed the fact of their involvement to permeate conversation likely to induce a certain awe and wonderment. The only secret lay in the latest technology hidden inside the tunnels where the steel and concrete structure below ground was simply to protect it against blast and radiation. The new centre with its many planning rooms, remained in use until the late 1970s when, just before new work was about to start, it was decided to move the Regional Seat to Crowborough.

Once again Dumpy was closed and stripped of its equipment, the government finally relinquishing possession in 1986. When the Cold War ended with the collapse of the Soviet Union, the majority of the other RSGs were abandoned and by the end of the decade all had been sold off or left to decay. The Dover Castle tunnel system is now run by English Heritage although the Dumpy level is still closed to public view.

With the Cold War on the wane, the Home Office relinquished the RSG in 1984 and it was subsequently taken over by English Heritage which opened Casemate level to the public in 1990. Telephone equipment from the 1940s-era was re-installed and the complex christened 'Hellfire Corner' after the wartime sobriquet for Dover.