SUSSEX INDUSTRIAL HISTORY

BRIGHTON STATION © KEITH LEICESTER

Frank Gregory – Brighton Railway Station – Construction of H.M.S. Forward Bevendean Isolation Hospital – Tank Roads – Hastings Power Supply

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SUSSEX INDUSTRIAL HISTORY

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FRANK WILLIAM GREGORY
3 November 1917 - 7 June 1998

Joy & Chris Ford

(The following notes were written by Frank's daughter and son-in-law and were read by the Reverend Colin Still at Frank's funeral on 19 June 1998.)

Frank was born at home in St Luke's Terrace, Brighton, on 3 November 1917 to be followed three years later by his sister Eileen. His father was over 50 when Frank was born, so one can imagine home-life being a strict 'Victorian' regime.

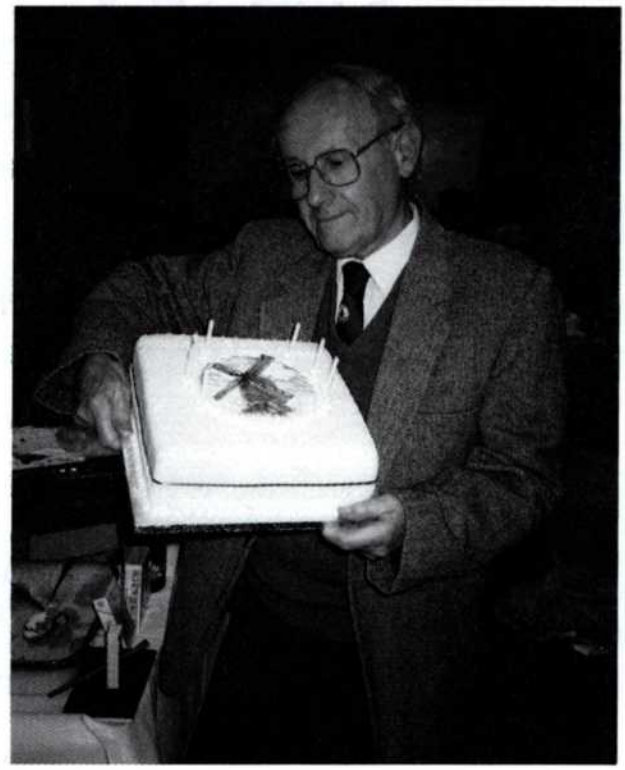
His parents had a strong interest in the countryside and were regular walkers. This environment must have influenced the young Frank who, from an early age, began to take a keen interest in the countryside and its buildings, whether they were farmhouses, churches or, what was to become a lifelong fascination – wind and watermills. He also became deeply interested in the history of the countryside, in his early years becoming an amateur archaeologist helping with various 'digs' on the Downs excavating the many Iron Age forts or Roman fortifications that can be found there.

He started walking, but was clearly somewhat of a rebel – joining the newly formed Sussex Pathfinders rather than following in his parents footsteps with the Brighton Rambling Club.

Educated at the Brighton, Hove and Sussex Grammar School for Boys, he went on to be trained as a Woodwork Teacher. Before he could take up a teaching post the war intervened and he found himself in the army, based at Aldershot dealing with logistics of troop movements for the war effort. But a mere World War was not going to stop Frank and his quest for knowledge. He had his bike and with this he managed on his rest days to travel a huge area of Southern England searching out mills or joining up with the Pathfinders on their weekend walks (bike and all !).

After the war he returned to civilian life and started teaching at schools in Croydon, travelling from the family home, now in Harrington Road Brighton, by train every day, Always an explorer he found every conceivable route by rail between Brighton and Croydon that existed at that time. Today only the main London Brighton route still remains and we can only imagine the steam trains puffing their way along all those other routes that Beeching closed in the 1960s.

But the day job was always an incidental activity to Frank. He lived for the evenings, weekends and holidays when he would continue his walking and exploring.



Frank admires his 80th birthday cake, 9th Nov '97
(P.J. Hill)

In 1946 he was approached by the then President of the Sussex Pathfinders to take on the role of Club Secretary. It was never clear whether he took on the role with enthusiasm or not, but once there he quickly became thoroughly involved, helping to rebuild the membership from just a handful of 'post-war' survivors to a group of around 100 and within a couple of years he also took on the role of Treasurer as well. So was set a pattern, with Frank essentially running the Club single handed – planning all the walks, dealing with the membership fees and new members and going out with the Club virtually every Sunday. He finally stood down as Secretary and Treasurer in 1977, 31 years later!

The Club did have its benefits for Frank, he met his future wife Betty, a young lady who had recently moved down from Hertfordshire with her parents and Brenda, Gladys and Edd to Worthing. She, like many others, joined a local walking group to make new friends. Which walk they first met on and how the romance blossomed may be lost in time, but the outcome was that in 1952 they were married. Walking always remained a common interest that kept them together.

In 1957 Frank and Betty were blessed with their only daughter Joy. Shortly afterwards he found a teaching post in Brighton and remained working in the town until his retirement.

Frank must have seen a tremendous change in the way of everyday life in his own lifetime, in his late teens and early twenties he would have still been able to see a

rural way of life that had remained largely unchanged for centuries. Wind and water power had largely been supplanted first by steam and then diesel power, but there were still many farms and mills being run largely on a 'local' scale. The post war years rapidly changed this, modern large scale farming practices came in, corn was harvested mechanically and taken to huge roller mills and the few working wind and water mills rapidly came to the end of their economic lives. The rail network that he had so extensively used in his early years was decimated in the Beeching cuts in the early and mid 1960s.

Looking back, there seemed to be scant interest in our culture and heritage in those post war years, Everything had to be modern and new, anything old had to be torn down or covered up in a modern exterior. But there was a backlash to this all pervading sea of modernisation, there were still people who wanted to preserve and conserve examples of life from times past. And so in a sense another chapter of Frank's life opened. His particular area of focus remained Wind and Watermills but he found himself in good company, There still being a strong community of interest in the subject – the first big restoration project that he became involved in was Nutley Windmill on Ashdown Forest where he joined with others in task that took them around a decade from the mid sixties to mid seventies. Somehow he managed to fit this in with his teaching, walking and continued exploration for mills and other antiquities, largely in the UK, but also abroad.

Of course, during this time his daughter Joy was growing up and by 1974 boyfriends starting to appear on the scene. One such young man by the name of Chris appeared one Saturday afternoon in October. Quite what Frank made of him when returning from another day at Nutley was never recorded, nor whether it registered with Frank that the same young man was becoming a fixture at the Gregory home over the following year. To Frank's credit when the young couple announced their intention to get married, in the autumn of 1975, he was supportive when others in the family expressed greater concerns. The wedding took place in December 1975 and it was only a few months later that Frank's wife, Betty, tragically died. That trauma brought Frank, Joy and Chris together as perhaps nothing else could or would have done. At first Joy and Chris spent weekends and holiday times at the family home whilst they were still at college, then they moved to a house around the corner to Frank. So started a routine that remained for the next 22 years of Frank popping round for an hour or two most evenings. It was during these visits that stories of Frank's early life unfolded and he discovered a common interest with Chris in maps, the countryside and walking.

In 1977 Frank retired from teaching and was able to follow his other pursuits fully. He continued to support the many mill restoration projects in Sussex and in particular became deeply involved in the work going on at his 'local' windmills at West Blatchington and Oldland. He maintained his interest in industrial archaeology, belonging to a number of local groups and still going out to investigate sites with them until just a few month before his death. He also took a keen interest in various local museums and industrial archaeology establishments.

He continued travelling widely throughout Britain, continuing to track down mills in all states of repair or disrepair and continued collecting milling memorabilia. He also started to travel more widely abroad, always in search of mills and rarely returning home disappointed. He travelled through most of Europe including a visit to Russia, with the occasional visit across to the United States and Canada for his quest. He never finished searching and never lost his inquisitiveness right up to his death. For Frank there was never too much that you could know about mills and archaeology.

Returning to Frank's family, he became a grandfather in 1983, when his first grandson, Jonathan, was born. Grandad and grandson hit it off almost at once, and from then on Joy and Chris often felt that visits were far less to see them than to check on the progress of the young addition to the family. Frank was a 'natural' with children, possibly a reflection that there was a lot of the young boy still in him, even in his seventies. He formed a strong bond with his second and third grandsons, Nicholas and William. There was always a rush to the front door to let him in whenever the familiar three rings on the bell were heard.

It was just last November that Frank reached 80 years young and the family organised a surprise party for him, gathering together friends and family to celebrate his birthday with him. It did appear to be a genuine surprise to him and the look of amazement on his face to see so many of his friends assembled together was a joy in itself. Perhaps the best part of that afternoon was that so many were able to pay tribute to him personally for his achievements during his life. Although no-one there that afternoon had a thought that they were so close to the end of his mortal life.

Our loss is not just of a wonderful father, grandfather and friend, but also all that knowledge locked in Frank's head. The milling community in particular have lost a vast repository of information, because very little of it has ever been written down. The only saving grace was the publication last autumn of his sketches of Sussex Watermills which he drew when a young man in 1936 and 1937. But these represent only a tiny fraction of one percent of what Frank knew. He will be sadly missed by us all.

BRIGHTON STATION – AN ARCHITECTURAL AND HISTORICAL APPRAISAL

Keith Leicester and Ron Martin

A BRIEF HISTORY

The London and Brighton Railway Act was passed in 1837 authorising the London and Brighton Railway Company to construct a route with branches both to Shoreham in the west and to Lewes and Newhaven in the east. Construction was commenced in 1838 and in July 1841 the track was opened from London to Haywards Heath and extended to Brighton in September 1841. The Shoreham branch had opened earlier in May, 1840 and the branch to Lewes and Newhaven was to open in December, 1847. The London and Brighton Railway Company combined with the London and Croydon Railway Company in 1846 to form the London, Brighton and South Coast Railway (LB&SCR).

THE 1840 STATION

In Brighton, the lines required considerable engineering works with extensive tunnels and cuttings into the chalk hill to the West and a sweeping 370 m (1200 ft) viaduct across the valley and over the London Road to the East. The large man-made plateau, stepped into the hillside was located at the then northern edge of the town on the north side of Trafalgar Street, the level of the plateau being determined by the height of the top of Trafalgar Street at the junction with Surrey Street. A vertical separation of the passenger and goods traffic was achieved with the passenger station and platforms located on the upper level, curving around the side of the hill; and the goods yard on a level some 10 m (32 ft.) lower. The Shoreham branch operated in 1840 from the first Brighton station at the foot of the chalk cliff some 90 m (300 ft.) to the North of the Station House. This is shown on a map of 1843[1] and on the print commemorating the opening of the Shoreham line[2] and probably continued in use as a parcels depot until the train shed was extended in 1861. This print also shows the octagonal brick water tower with semi-circular headed arched openings on all sides which was located close to the top end of the goods depot tunnel (Fig. 1).

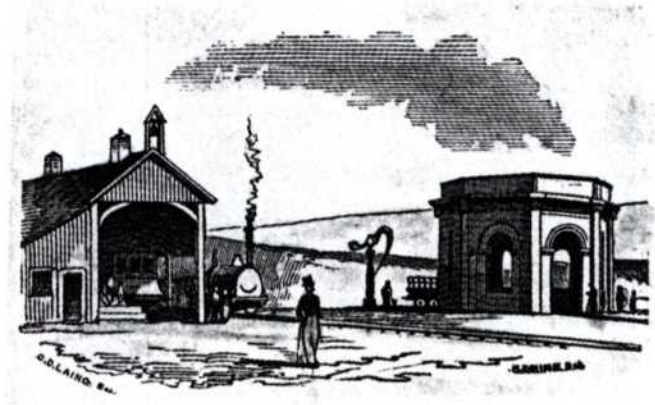


Fig. 1 Published by C. Andrews, 11 St. James's St., Brighton (1840)

The earthworks and the reconstruction of the hillscape enabled the new passenger station building to become a prominent landmark, positioned high above the town. The engineering works and the train shed were built under the direction of John Urpeth Rastrick, the Company's Chief Engineer, and were also probably designed by him. To level the 1 in 8 sloping site, a series of brick vaults to support the forecourt created a plateau some 73 m (240 ft.) wide and with a 9 m (30 ft.) high retaining wall along the east and south sides. The vaults were used for cellars and still have access from Trafalgar Street, some now being occupied by the Sussex Toy and Model Museum.

The Station was completed in 1841 and was constructed across the head of the nine incoming tracks. These were interconnected by a series of turntables to enable transverse shunting of rolling stock although it is probable that many of these were not installed until 1849 when twelve additional turntables were authorised.[3] The station was covered by a three-bay train shed covering an area of 50 m (166 ft.) wide by 87 m (285 ft.) long. The records show that in July 1841 Messrs. Bramah and Wool were paid £1,585.9.2 for the station roof and G. Cheeseman £1,280 for the passenger shed. As the latter also built the engine house it seems likely that this payment was the building works in connection with the station.[4] Plans were ordered to be prepared in 1854 for the platforms and roof to be lengthened in that year[5] but it is not clear whether this was carried out as no major item of expenditure occurred in the accounts. Plans were approved in 1861 (Fig. 2) for both the platforms and roof to be lengthened, for a new arrivals platform and a further narrower roof bay at the east side.[6] The building work for this work was carried out by J. Fabian at a tender sum of £7,307 and the ironwork by the Horseley Co. for £11,000. While the work to the roof was being carried out there was an accident on 24 October, 1861 when a section of the roof was blown down by the

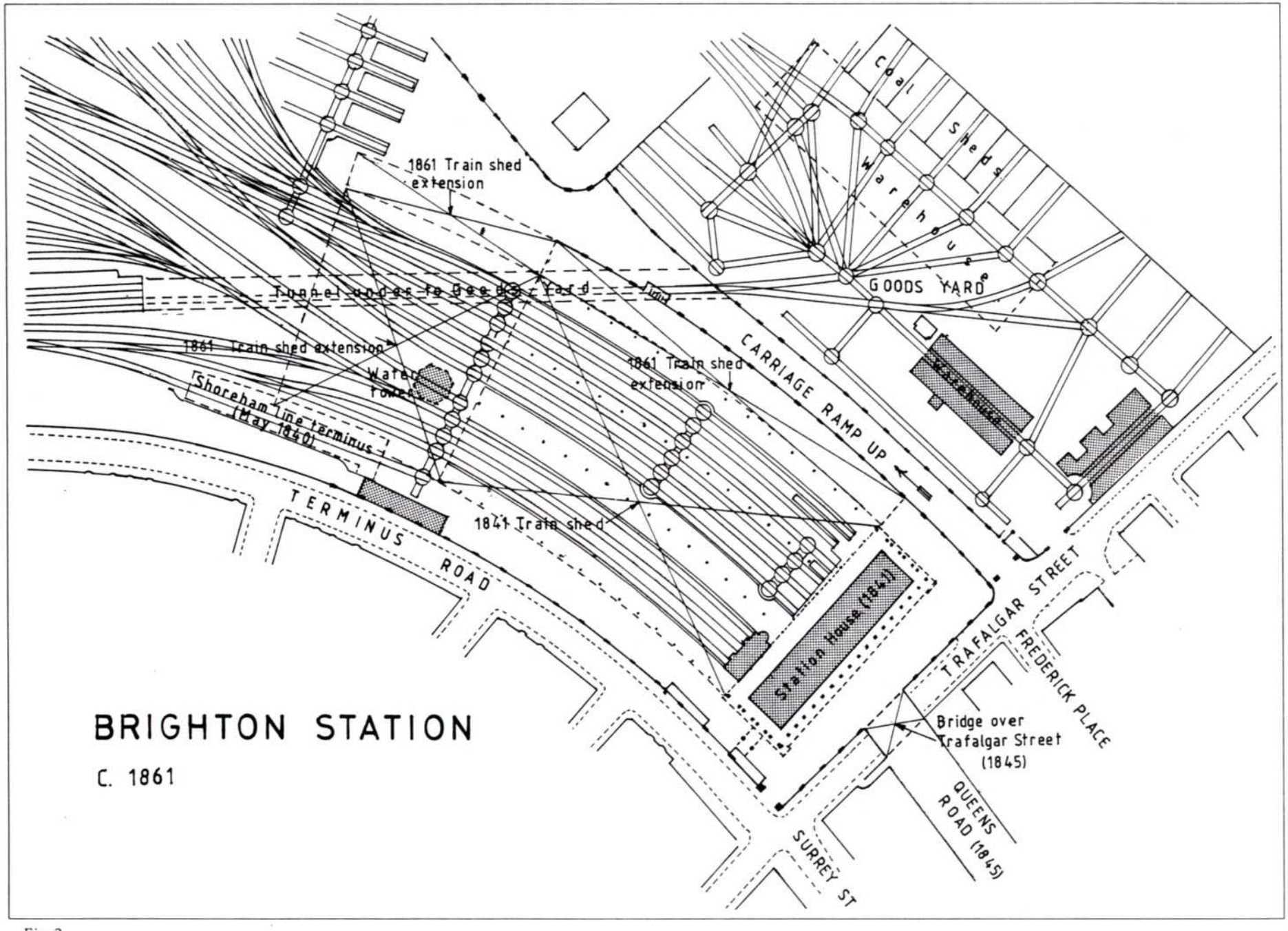

1861 Train shed extension
Tunnel under to Goods Yard
1861 Train shed extension
Water Tower
Shoreham line terminus (May 1840)
1841 Train shed
1861 Train shed extension
CARRIAGE RAMP UP
Coal Sheds
Warehouse
GOODS YARD
Warehouse
TERMINUS ROAD
Station House (1854)
TRAFALGAR STREET
FREDERICK PLACE
Bridge over Trafalgar Street (1845)
QUEENS ROAD (1845)
SURREY ST
BRIGHTON STATION
C. 1861

Fig. 2

wind damaging a large part of the brickwork.[7] In1863, an elaborate clock tower was built near the site of the old water tower, shown on a contemporary photograph[8] and the roof was extended over the Portsmouth arrival platform.

GOODS DEPOT TUNNEL

Goods traffic to and from the Shoreham branch operated through a tunnel running diagonally under the passenger lines from a point just to the south of the present New England Road Bridge. The gradient of this tunnel was about 1 in 60 with the upper end in a deep cutting[9]. The line was operated "by working every truck separately up and down the incline by manual or horse power".[10] The tunnel is circular, brick lined and 7 m (23 ft.) diameter. The tunnel was apparently lengthened in 1847 as according to the accounts of 31 December, 1847, £3051.13s.10d was expended on "additional works and lengthening the Tunnel".[11] There is no other tunnel on the site to which this could refer. The lower end of the tunnel is still in evidence and was used until recently as a rifle range. The tunnel became largely redundant in 1852 when a new branch line to the goods yard was built leaving the main London line at TQ 306057 some 500 m (1649 ft) north of New England Road, which it crossed by a cast iron arched underbridge (still extant) and skirted the area which subsequently became the locomotive works and is now the station car park.

CARRIAGE RAMP (ALSO KNOWN AS CAB APPROACH)

Access for wheeled road vehicles into the station would have been difficult as the principal route would have been up Trafalgar Street with a gradient of about 1 in 7 for the upper part. The designers obviously realised this and a carriage ramp was created along the east side of the station rising from Trafalgar Street level up to platform level, 130 m (220 ft.) further north, with a gradient of about 1 in 13. This would have enabled entry to the station via the ramp and return through the forecourt and down the top of Trafalgar Street (Fig. 2). There has been some discussion about the date of the erection of this ramp but close inspection of the 1840 retaining wall along the east side clearly shows the gradient of the original ramp.

The ramp was altered in 1883. A new entrance doorway from Trafalgar Street was constructed with a handsome elliptical headed arch. The top end was reduced in width at its west side to give space for the foundations for the train shed columns and at the same time the gradient of the ramp was eased to about 1 in 26. To accommodate the additional length, a hairpin bend was incorporated and the top of the ramp was made to terminate in what is now Platform 7. This ramp continued in use for licensed cabs waiting for incoming trains until the advent of motor cabs which were unable to negotiate the hairpin bend. A late nineteenth century photograph shows a line of waiting cabs in Terminus Road.[11] These were unlicensed cabs which were allowed into the forecourt two at a time, presumably to pick up passengers when no licensed cabs were available.

THE 1840 STATION HOUSE

The early Victorian railway companies were very status conscious and needed buildings of prestige to symbolise their commercial success and thereby build shareholder confidence. The elegant architectural design on a elevated site fitted the Company's aspirations very well at that time.

The building, designed by David Mocatta in 1839 and completed in 1841, was the headquarters of the London and Brighton Company. The architect, a pupil of Sir John Soane, was in independent practice at 32 Brunswick Square, Hove and is remembered for his classical designs for stations for the LB & SCR. He was never a company employee and was commissioned when the company was prepared to pay for such extras. He prepared a number of sketch designs for Brighton in the Italianate classical style and the final design was a two storey building 15 bays wide with a raised attic roof, a second floor and basements 3 bays wide at each end. The parapets are balustraded with a solid section at the front containing the station clock supported by curly brackets. The building was skirted along the south, east and west sides with a single storey covered arcade 2.4 m (8 ft.) wide supported by cast iron columns. Along the north side there was a flat roof infilling the space between the building and the south side of the train shed (Fig. 3).

All the external walls are rendered, lined out to imitated stonework, with indented rusticated quoins and a frieze and cornice at parapet level. The upper storey windows have architraves and hood moulds with alternately triangular and segmental pediments. The ground floor was used by the travelling public and was sub-divided with duplicate accommodation for the London passengers on the east side and the Shoreham passengers on the west side. Each side contained a booking office, waiting room, parcel room and lavatories. The main board room for the company was located on the first floor and was flanked by accommodation for the Engineer on one side and the Secretary on the other. Each department was approached separately by staircases located at each end of the building. In the 1850s some of the upper rooms

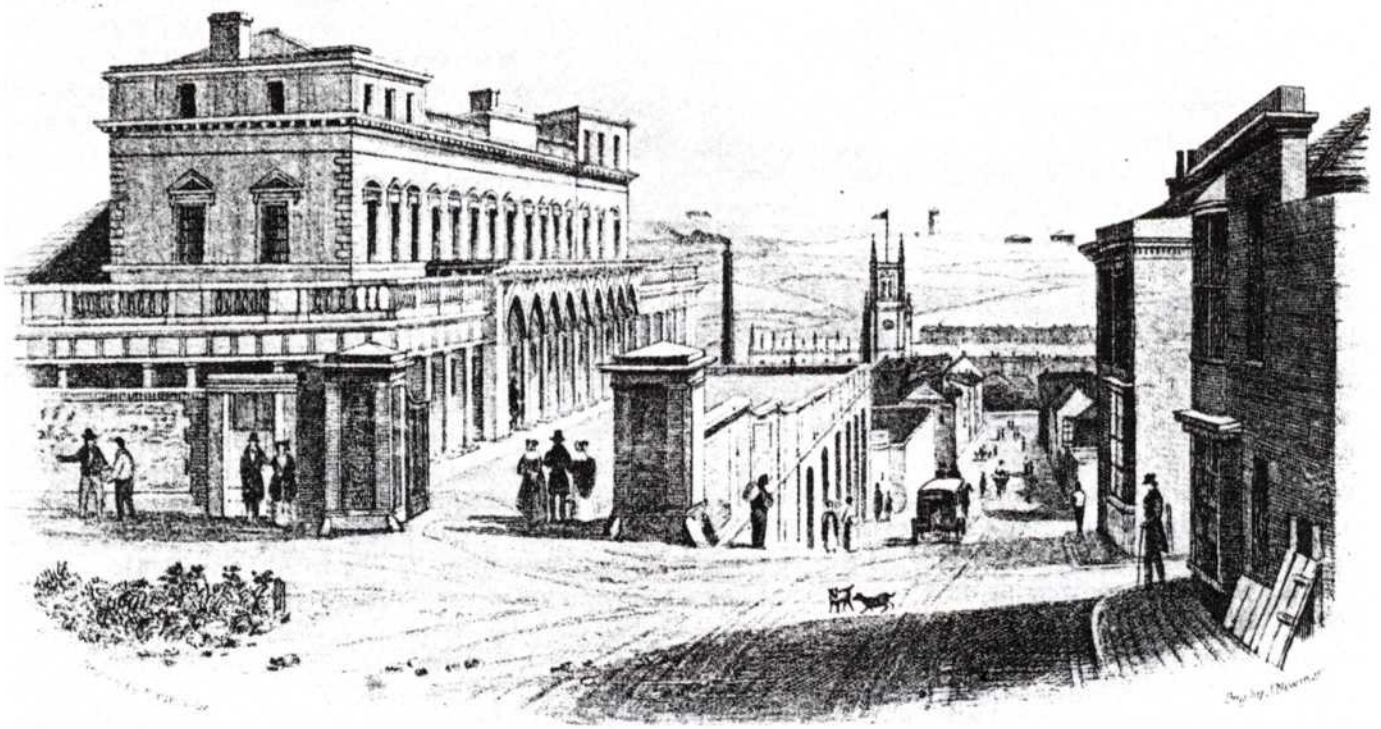


Fig. 3 View of the Railway Terminus, Brighton
(F.W. Woledge, Six Brighton Views No.2 (1842) Pl.6

were converted to form a dwelling for J.C. Craven, the Locomotive Superintendent.[13]

The station house was subsequently altered, as part of the 1883 reconstruction, by extending the ground floor northwards by about 3 m (10 ft.). In 1924, excavation was carried out around the foundations underneath the centre of the building creating two flights of steps leading down from the concourse to men's and women's toilets and with a new access into Trafalgar Street. A barbers' shop was also created in the west basement. The interior of the ground floor was altered in 1979 to create a new Travel Centre at the west side and in 1980 to form a new Ticket Office. Recently the ground storey has been "tidied up" and all the original features have been removed, although a recent Planning Application proposes to restore doors of traditional design.

THE QUEEN'S ROAD BRIDGE

In 1844, Brighton Corporation in an attempt to improve the approach from the town built Queen's Road, continuing the line of West Street straight up to the station forecourt. The LB&SCR must have realised the improvement that this gave to the station as they contributed £2,000 to the cost of this work and built a bridge over Trafalgar Street, comprising a series of cast iron elliptical arches. The bridge was widened in 1863 and again in 1875.[14]

THE 1882/4 IMPROVEMENTS

In response to the increase in passengers to and from Brighton, the platforms had been previously lengthened from the original 1840 layout, but by the 1870s passenger traffic had increased to the extent that more platform and station accommodation were required. By that time, Brighton was already an important railway engineering centre for the construction of locomotives and carriages serving Sussex and Surrey. One can imagine that the directors of the LB&SCR wanted a new prestigious building to symbolise and reflect the prosperity of their enterprise. The result was an almost entirely new station. The great roof we see today was built towards the end of a prolific period of Victorian railway shed construction and it compares well with the best.

The radical transformation of the station was carried out with a number of building contracts running concurrently and starting in 1882, viz:
Contract No 1: The main shed on the north side including the station widening
Contract No.2: The carriage shelter to the south
Contracts Nos. 3,4 and 5: The construction of the new

offices on the east and west sides and the re-assembly of the original shed in the goods yard

THE 1882 TRAIN SHED

To allow for the continued use of the station during the reconstruction, the new roof structure was built over the old train shed. To a certain extent, the height of the old shed determined the height of the new building. This is confirmed by a photograph of 1883 which shows the horizontal tie rods just clearing the old shed ridges.[15] The old sheds provided some protection whilst the new roof was constructed overhead. Late in 1883, the Rastrick shed was dismantled and re-erected in the goods yard at the lower level and continued as a warehouse until after World War II.

The new roof was designed by Henry Wallis under the direction of the Engineer-in-Chief of the LB&SCR, Frederick Banister. Eight firms tendered for the work and the Midlands engineering firm, the Patent Shaft and Axletree Company of Wednesbury won the contract. The roof design has similarities to other structures. Some elements of roof geometry are similar to Liverpool Street (Great Eastern Railway, 1875) – with elliptical ties and a glazed pitched roof. It also has some of the simplicity of French train sheds such as the Gare St. Lazare and the Gare du Nord in Paris and many main line provincial stations.

The two curved and parallel spans are 34 m (112 ft.) wide and are approximately 175 m (575 ft.) and 185 m (600 ft.) long respectively and rise 22 m (75 ft.) above the platforms. Adjoining smaller spans part 12 m (36 ft.) and part 14 m (46 ft.) on the east side corresponds to the expanded station width and a half span of 4.5 m (15 ft.) exists at the west side. The initial designs for the new roof had transverse ridge and furrow side galleries similar to those at London Bridge and Liverpool Street Stations in London, but later these were amended to the two in-line arched spans we see today. The increase from the nine to eleven platforms required the area of the station to be expanded over part of the lower goods yard and platforms 9, 10 and 11 were carried on steel girders over the top of the carriage ramp. In 1932, on electrification, the track serving the short platform 9 was closed and used for access to the car park and platform 4 was abandoned. Platforms 5-11 were renumbered 4-10 and recently platform 10 has been closed.

The principal roof frames are steel composite elliptical riveted channels with diagonal braces. Lattice purlins, sized to suit the curve of the station, link each of the principal frames. About 80 quatrefoil section cast iron columns support roof frames at 8.5 m (28 ft.) centres (a quarter of the principal spans) with decorated cast iron spandrels supporting composite steel and cast iron Warren girders. Each end of the station roof has vertical glazed panels and wind bracing. The east elevation is covered with timber panelling four panels high filled in with diagonal tongued and grooved boarding, the top panel louvred, but some of these at the north end were replaced in 1924 with corrugated asbestos-cement sheeting. Also the ornate canopy to Platform 10 was removed and a simpler valance detail added. The columns along the east side have one flat side to enable the external boarding to run flush across the outside.

The upper roof has a continuous ventilating 'lantern' at ridge level designed to allow heat and smoke to escape. This is covered with timber framed panels filled with grooved boards fitted with iron tongues and finished with Italian roll, 18 gauge profiled zinc sheet fixed to half-round timber battens. The east side spans have a modified curved lantern. About 40% of the roof was glazed using "Helliwell's" patent glazing bar system with the glass fixed between two zinc bars and firmly held in place with screws in lieu of putty. The original specification for the glass was ¼" Hartley's rough plate. The plan area of the station is 1.77 hectares (4.7 acres) and the roof has a surface area of 2 hectares (about 5 acres).

The original drawings do not show methods of access for roof maintenance. The external cast iron steps located along the principals together with the lead covered steps on the intermediate rafters were added in 1899. These steps, which are a visual feature from Terminus Road, allowed maintenance to be carried out using a system of 4 m (14 ft.) planks placed across and spanning between the steps. This precarious and dangerous method of working had minimal safety standards and is no longer in use.

The Company had originally intended to light the station at night by dual burner gas lamps but in 1883 the Hammond Electric Light Company of North Road, Brighton, fitted electric lighting.

> "Twelve arc lamps of about 2000 candle power each are ranged in a double row down the centre of each of the elliptical spans of the new roofing, being suspended from iron stays that bond the iron columns together. The whole station seems bathed in a flood of light and the brilliancy throws up the graceful proportions of the new roofing, and penetrates the glazing into the atmosphere above, producing a kind of phosphorescent effect. Looking at the experiment thus inaugurated merely as a test of the illuminating advantages of the Electric Light for buildings of this description, we would say the result was one of the most encouraging yet witnessed in Brighton"
> (*The Brighton Times* 1838)

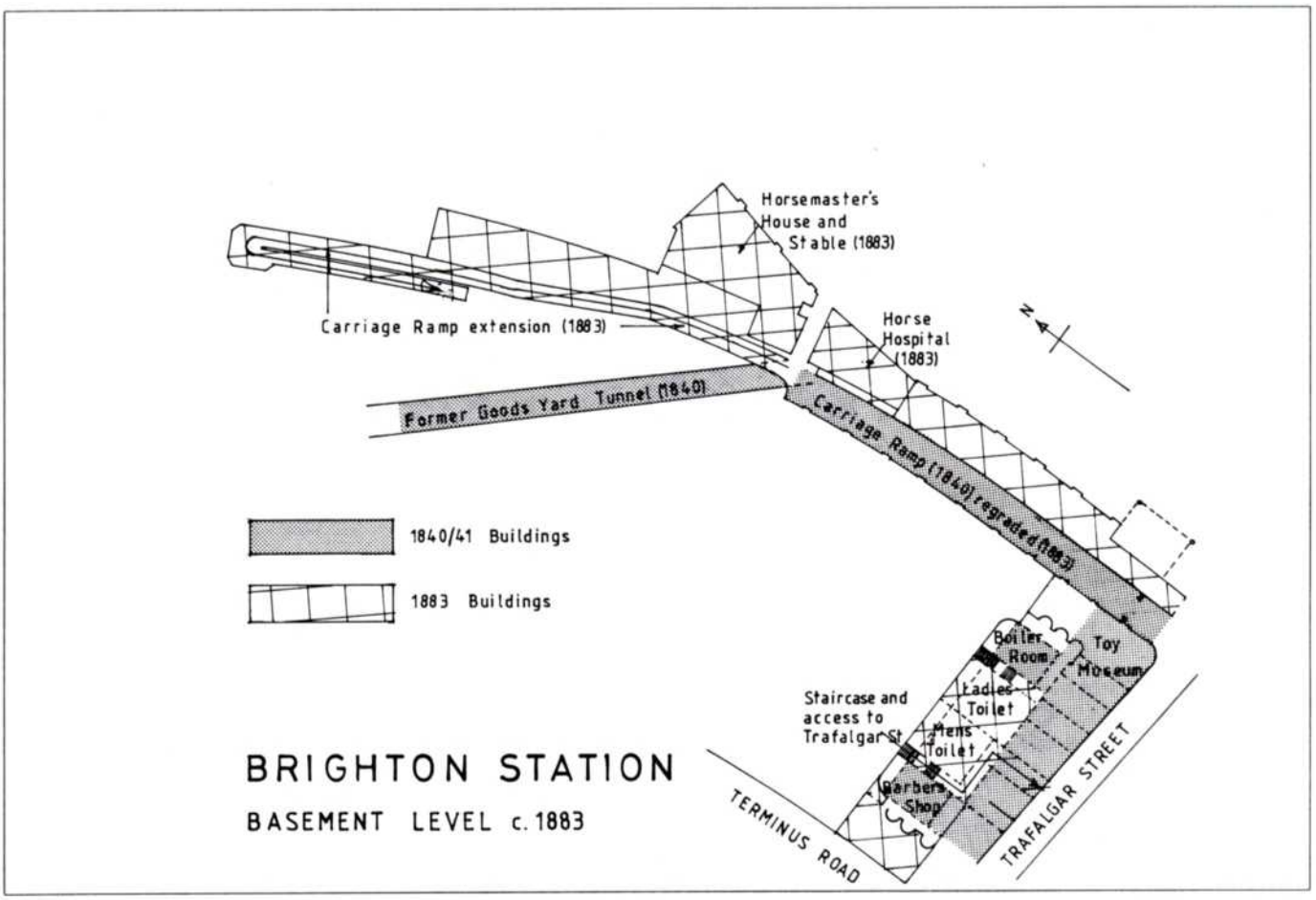


Fig. 4

THE PORTE COCHERE (ALSO KNOWN AS THE CARRIAGE SHED)

This was designed by Henry Wallis at the same time as the main train shed and was constructed by Young and Co. who built the Victoria Station roof. The unequal projection of the porte cochère bays, using a 9 m (29 ft.) module, accommodated the bridge over Trafalgar Street. The arched ribs of the roof construction are decorated with scrolled fern design similar to that proposed for the train shed but not carried out. The spandrel brackets are more geometric than the ones in the main train shed and incorporate a spoked wheel design. The feature of the raised ventilator is still in place The contract drawings show timber glazing bars and screwed cappings – a simpler variation of the Paxton wooden patent glazing system as designed for the Crystal Palace. The construction of the porte cochère required the irreverent removal of the ground floor colonnade of the original Mocatta building. This surprising decision appears to have been taken for structural reasons. The foundation of the colonnade columns was a continuous arched wall which progressively increased in height from west to east and these were used as the base for the foundations of the new porte cochère columns. At the entrance from Queen's Road there are gates hung on heavy iron posts. It has been suggested that these are former Crimea War period cannons removed from the West Battery. This is not correct as close inspection of these posts reveals that these are ordinary cast iron pipes with mouldings applied to simulate gun barrels.

CONCOURSE AREA AND ANCILLARY ACCOMMODATION

The concourse area of 20 m (60 ft.) x 60 m (200 ft.) was created in 1882/83 with the reconstruction of the new roof. Previously the tracks had terminated about 5 m (16 ft.) from the rear of the old station house. Timber kiosks – W.H. Smiths and a bureau de change – were fitted in line with the ticket barriers together with the train indicator board. This layout was superseded with the introduction of the new electronic indicator board in 1987 and the relocation of the bookstall to the east. The suspended four faced clock dates from 1883 and still bears the Company monogram "LB & SCR" in iron scrolls. There are two ranges of buildings built in 1883 underneath the train shed roof, one along the west side fronting on to Terminus Road and the other on the east side built partly on the old goods yard and partly above the old carriage ramp (Fig. 4). These are all built of yellow bricks in English bond with pilasters

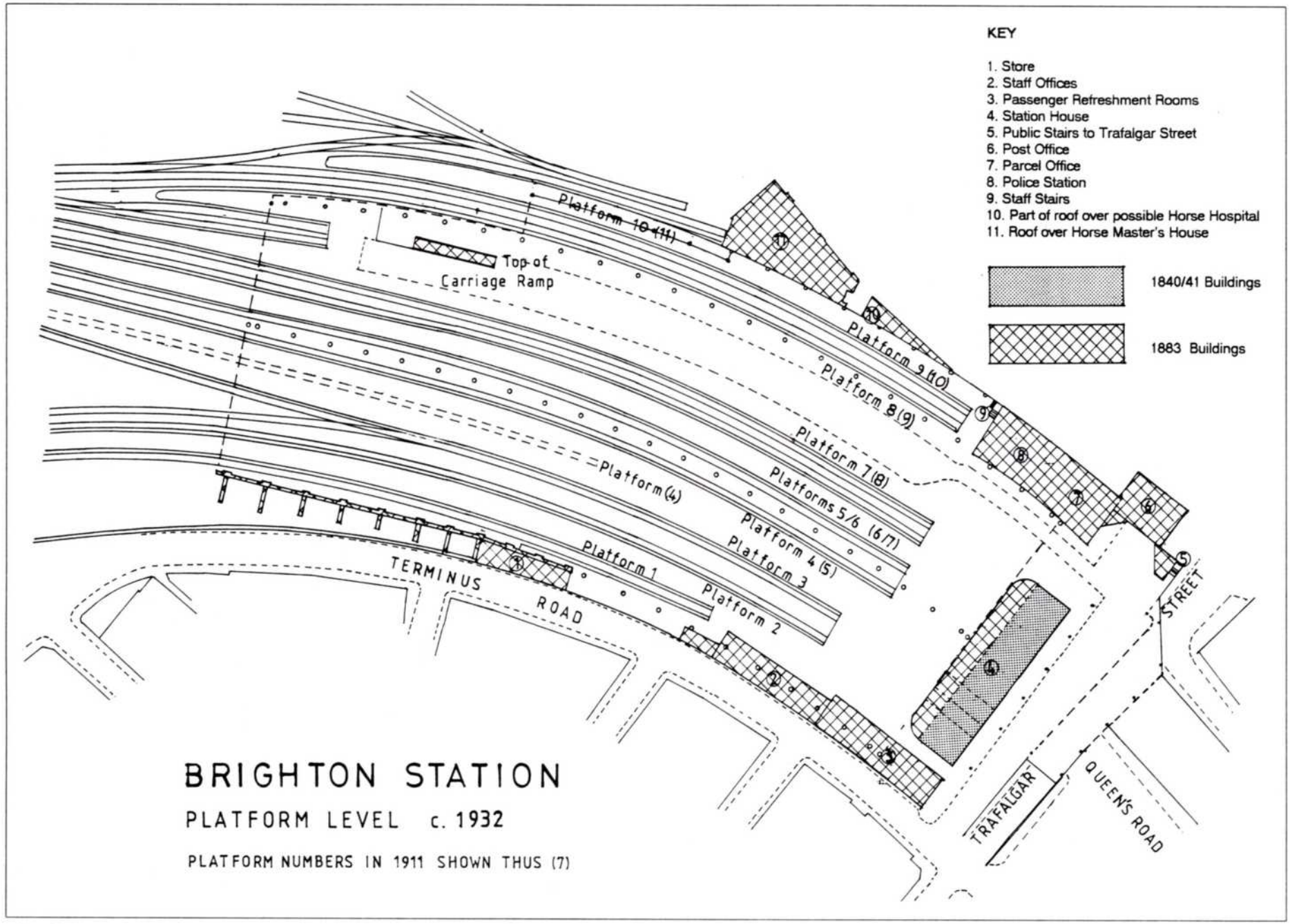

KEY
1. Store
2. Staff Offices
3. Passenger Refreshment Rooms
4. Station House
5. Public Stairs to Trafalgar Street
6. Post Office
7. Parcel Office
8. Police Station
9. Staff Stairs
10. Part of roof over possible Horse Hospital
11. Roof over Horse Master's House
1840/41 Buildings
1883 Buildings
Platform 10 (11)
Top of Carriage Ramp
Platform 9 (10)
Platform 8 (9)
Platform 7 (8)
Platforms 5/6 (6/7)
Platform 4 (5)
Platform 3
Platform 2
Platform 1
Platform (4)
TERMINUS ROAD
STREET
TRAFALGAR
QUEEN'S ROAD
BRIGHTON STATION
PLATFORM LEVEL c. 1932
PLATFORM NUMBERS IN 1911 SHOWN THUS (7)

Fig. 5

and red brick plinth course, string courses at window arch springings and at parapet level, with timber casement windows with transoms, segmental or elliptical headed moulded red rubbed and gauged brick arches with hood moulds.

The range along the west side comprises at the south end a two-storey building used as passenger refreshment rooms and now housing the cafeteria and a public house named "The Prince Regent" and with staff accommodation over. The ground storey of this building was rendered some time after 1919 (probably during the 1924 improvements) as a 1919 photograph of dedication of War Memorial still shows brickwork)[17]. The single storey buildings to the north of this contains staff offices although the one immediately to the north of the refreshment rooms appears to have been built later. At the extreme north end of this side the side wall supports the last ten bays of the roof.

Along the east side there is a single-storey range comprising British Transport police station, parcels depot and stores. The parcels depot is in effect three stories high with the concourse access being at the upper level and the ground floor at goods yard level with loading bays, recently discontinued. Staff stairs and a later goods lift link each level. Another flight of stairs also links the southeast corner of the concourse with Trafalgar Street and was presumably used for passenger access.

Another interesting piece of construction dating from 1883 is the extension of the parcel office out over the goods yard, supported on two cast iron columns, 8 m (30 ft.) high. This was formerly used as a post office and is now used as a ticket store. It projects beyond the area of the train shed and is covered with a hipped slate-covered roof.

At the goods depot level there was a range of buildings which had a variety of uses. Just south of the exit of the former goods depot tunnel there was a stable building with a stepped ramp for access at the rear which has been referred to as the "horse hospital" and to the north of this there is the house formerly occupied by the Horse Master with an adjacent stable (Fig. 4).[18]

It is interesting to speculate whether, in 1882, it was the intention of the LB&SCR to remove all signs of the Mocatta building. If so, why did they not demolish the lot at that time? The answer may has been simple economics. Demolition and reconstruction would have been additional expense to an already overspent budget. It may have been lack of money that prevented it from being demolished. Perhaps it was because the Company did not choose to relocate its board room. In any event the act of encirclement with cast iron and glass effectively shrouded the, then out of favour, Renaissance style. The old building was thus retained and converted to utility accommodation. The department offices were linked by a first floor bridge to the new offices on the west side. All that remained is the upper stories which are only visible from the air or across the valley. Internally there are a number of fragments remaining – the staircase balustrades, handrails and some window panelling and architraves. It would be a most satisfactory arrangement if some of the feature of the original 1840 building could be reinstated

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18. Glen Henderson of Connex South East, hearsay remarks.

ACKNOWLEDGEMENTS

KEITH LEICESTER is a partner in the firm of Steven Frankham Associates, Surveyors, Engineers and Architects who were responsible for an Architectural and Historical Appraisal of Brighton Station prior to the recent refurbishment. This article is largely based on this Appraisal

JOHN MINNIS, who has read this article and made numerous helpful comments which have been incorporated in the text.

THE CONSTRUCTION OF THE SECRET TUNNELS OF SOUTH HEIGHTON

Geoffrey Ellis

In a previous article (*SIH* 27 – 1997) the existence, raison d'être, operation and history of H.M.S. Forward, the Royal Naval Headquarters at Newhaven (1941-45) was revealed. Following the cessation of hostilities the establishment was closed down, and all visible military customisation of the Guinness Trust Holiday Home building was removed before the property was handed back to the Guinness Trust. However, the labyrinth of tunnels was not secured at the western entrance, and consequently much looting of the tunnel contents occurred. Nonetheless, the tunnels were officially considered 'secret' for the customary thirty years after the war.

Only after the expiry of this period were three files, deemed suitable for release into the public domain, de-restricted. Unfortunately those files contain no physical details of the tunnels. Consequently one of the first priorities of my research was to carry out an extensive survey from which detailed sets of plans, and realistic estimates of cubic capacity of materials removed, could be produced. When shown these plans, veterans who served here (traced by appeal) were able to identify the purposes accorded to the majority of the chambers.

By remarkable serendipity, five years almost to the day after beginning the research, it was learned that Lt. Col. Dennis Day R.E., Officer in charge of excavating the tunnels back in 1941, was seeking assistance to determine the exact location of the tunnel entrance. Subsequent hillside residential development, road reconstruction, and mother nature had all conspired to disguise the brick and concrete entrance (Fig. 2). I agreed to meet him at Newhaven Local & Maritime Museum just two hundred yards from the entrance on 5 November 1997.

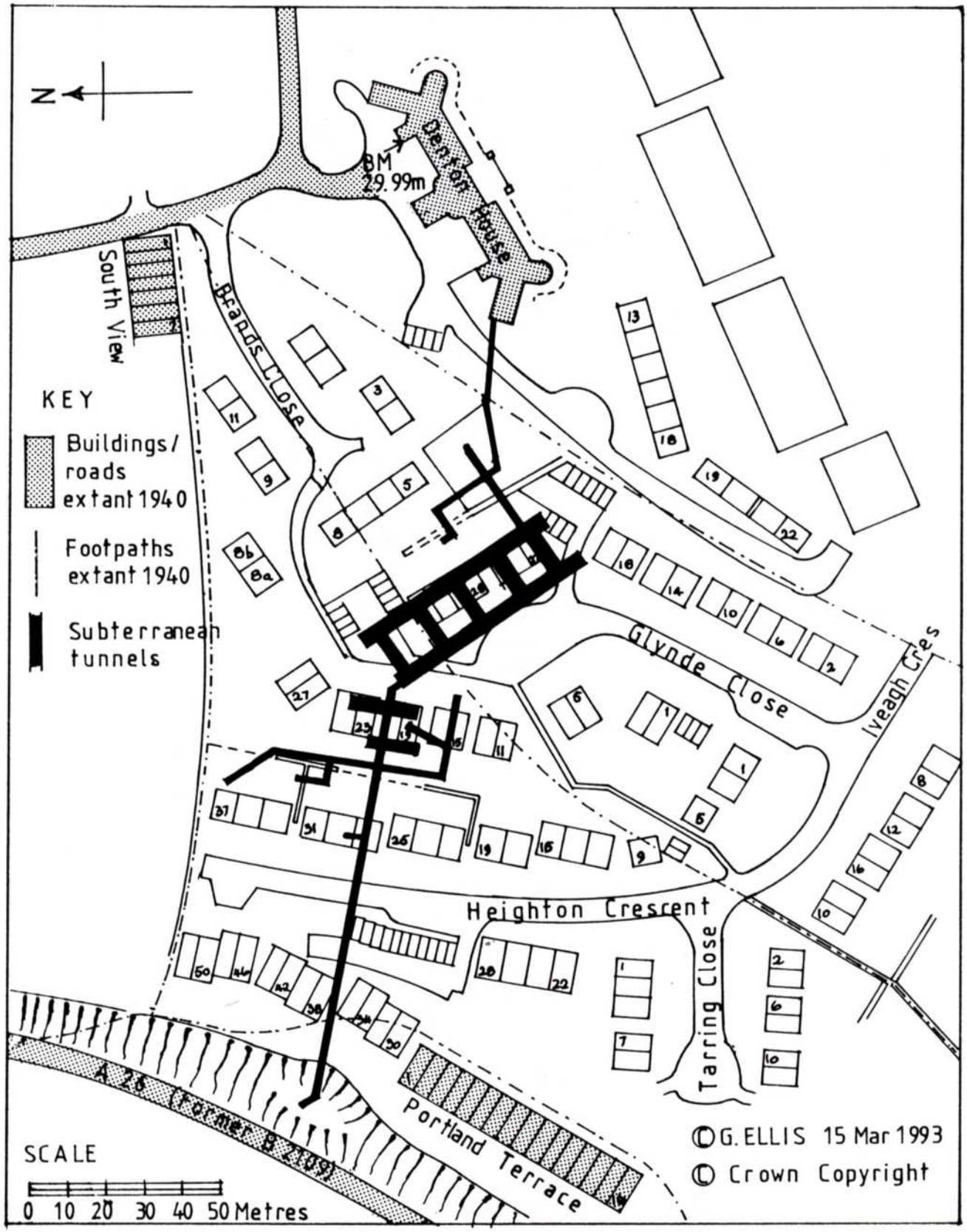
During our meeting Dennis revealed that as Lt. Day, he was in direct charge of a party of Sappers of 172 Tunnelling Company R.E. Amazingly he had retained his original copies of the plans for the labyrinth. Moreover he had also preserved copies of the detailed weekly progress reports, man-hour statistics, dates of accomplishment, graphs, mechanical aids used etc, right down to the quantities of fuel and oil used in the compressors. He very kindly gave me this information

Fig. 2 H.M.S. Forward Western Entrance June 1964. The flat area in front of the portal formed a rail head for a miners' tramway during excavation. Near right is the concrete roof of the submerged pillbox defending the tunnel entrance.

on learning of my ambition to have the tunnels scheduled as an Ancient Monument. His very detailed notes have provided the basis of the following information.

This underground shelter is situated at South Heighton approx. 2 miles north of Newhaven on the Seaford – Lewes Road (*then B2109, now A26*) (Fig. 1). The entrance to the tunnel is 27 ft. above ordnance datum, and horizontal, with an average cover of 60 ft. for all chambers and galleries. All work was in chalk, which was quite dry and fairly hard, presenting no difficulties as far as mining was concerned. The entrance and exit were lined with 18 gauge Arcuate sheets held in position by steel arches 5 ft. wide and 6 ft. 6 in. high placed at 2 ft. 9 in. centres, and the chambers were lined with sheets and arches 9 ft. wide by 8 ft. high with similar spacing.

Accommodation was provided for Naval Captain, Naval Staff, plotting and naval operations room, and naval wireless telegraphy room. Also for Commanding Officer, Signals office and military wireless telegraphy room, accommodation for orderlies; telephone exchange and office; power plant and ventilating machinery; accumulator charging room; and water storage. Separate rest rooms with bunks for 20 officers, 32 women and 36 other ranks. Separate messes with cooking facilities for officers, women, and other ranks.



SOUTH HEIGHTON – H.M.S. FORWARD

SITE PLAN SHOWING RELATION OF TUNNELS

Based on the 25 inch Ordnance Survey map by permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office MC 88730M0001

Fig. 1

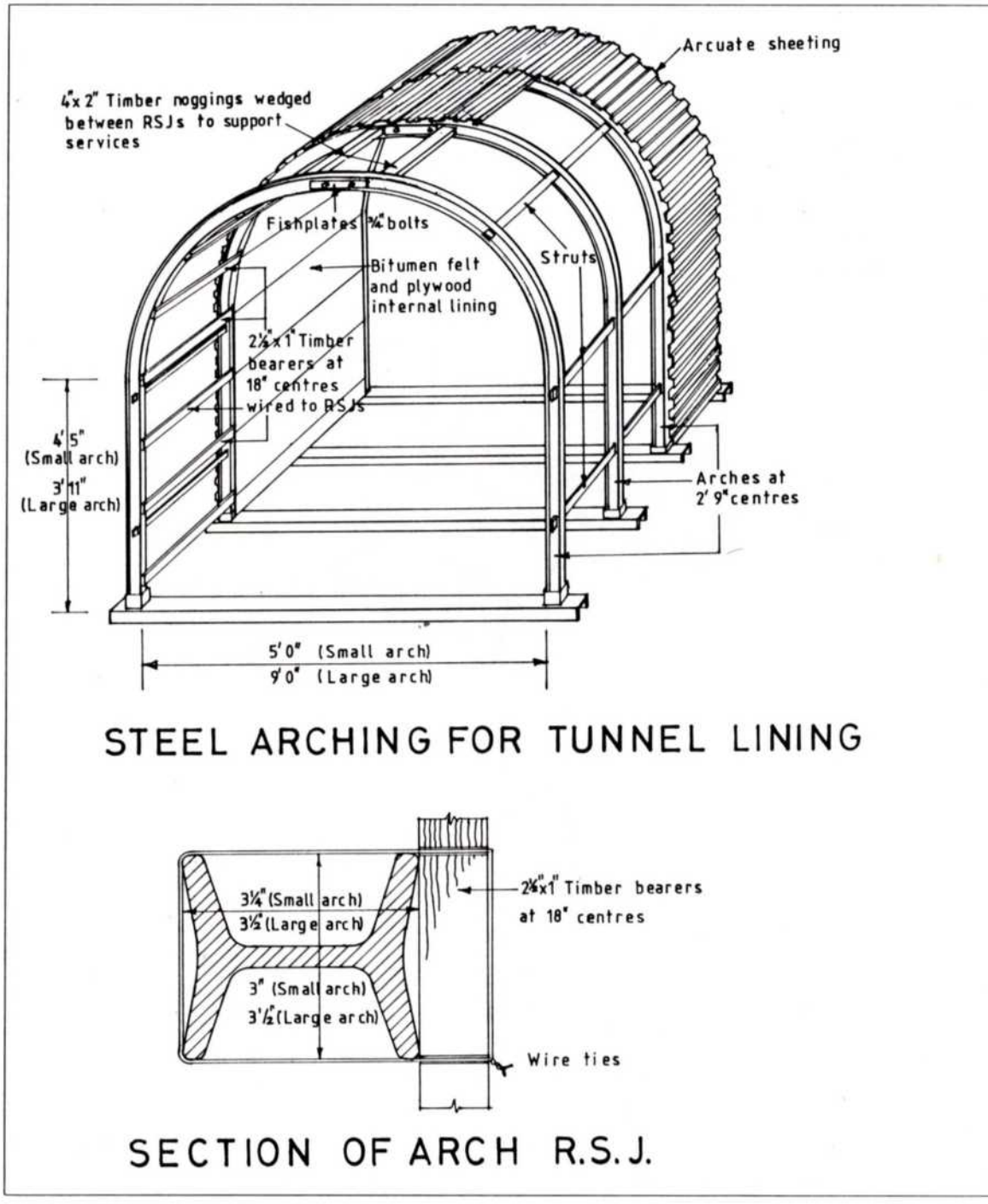


Fig. 3 (Redrawn from an 1941 drawing)

Work was commenced on 28 May 1941 and the first job consisted of cutting away a portion of the bank by the side of the road so that a hopper could be placed in a position such that the dumpers when filling would be clear of all normal traffic. Camouflage of the hopper and tunnel entrance was of paramount importance, but it was decided that this could not be done successfully until the hopper had been constructed. It was then a simple matter to lay the camouflage material on tightly strung wires, which were supported by substantial uprights.

A flat surface was cut into the side of the hill 14 ft. above road level, which gave a suitable elevation for the adit level, and allowed sufficient height to tip all the chalk into the hopper.

The hopper was of simple design, 14 ft. long, 12 ft. wide, by 5 ft. deep. The floor was 8 ft. above the road level supported by twelve RSJs placed 3 ft. apart in pairs, which in turn were supported on twelve 10 in. x 5 in. x 9 ft. legs. Dumpers were loaded by the removal of loose boards from the floor of the hopper, thus allowing the chalk to run through. It was only possible

to run the dumpers during hours of daylight i.e. 0600 hrs to 2200 hrs.

During the night shift the hopper would be filled to capacity, approx. 840 cu. ft. if closely packed during the peak period, i.e. when the 9 ft. chambers were being excavated, and the maximum number of men employed below ground.

Chaseside 60 cu. ft. forward-tipping dumpers supplied by 185 Mechanical Equipment Company were used for the disposal of spoil from the hopper to a nearby disused chalk quarry. They also supplied a fitter for their maintenance. At first the amount of chalk excavated per week was approx. 4500 cu. ft. and it was found that two dumpers could easily keep the hopper clear. After 19 July, however, when more men were employed below ground, it was found necessary to run three dumpers throughout the hours of daylight, and due to minor breakdowns, five of these machines were kept at our disposal.

The first tunnelling consisted of driving in the long horizontal entrance adit, the commencement of which was at right angles to the side of the hill. Lining consisted of 18 gauge Arcuate sheets held in position by 5 ft. x 6 ft. 6 in. steel arches (Fig. 3). For the first 12 ft., due to the loose nature of the ground, these were set at 1 ft. 4½ in. centres, after which they were set at the normal 2 ft. 9 in. centres. The axis of the tunnel was then turned 135° and from that point a straight line was maintained for a further 337 ft.. The chalk was fairly hard and dry at about 80 ft. containing numerous scattered flints and several thin beds. One bed about 2 in. thick was encountered halfway up the face and followed the work throughout. Occasionally flint in the floor would make the levelling of the ground sills slow and all picks required frequent sharpening for good results, both hand and windy picks lasting for little over one 8hr shift. Work of this nature was done by the Southern Railway Marine Workshops at Newhaven.

At a point 350 ft. in, two 9 ft. chambers combined lineal footage being 55 were constructed at right angles to the axis of the tunnel to accommodate the power plant and ventilating machinery (Fig. 4).

The axis of the tunnel was then turned 135° and at this point the small arches were replaced by the 9 ft. arches for the construction of the five chambers and two connecting galleries. The chambers were spaced at 38 ft. centres, with the connecting galleries running parallel at 50 ft. centres. A pilot tunnel was driven forward making it possible to have three 9 ft. faces working at the same time, and by continuing the pilot it was possible to reach the point chosen for the exit incline fairly rapidly. This was an advantage for the exit was well forward by the time the chambers and galleries were completed. It was not necessary to support the pilot tunnel.
From the point where the exit incline was designed to enter the shelter, an adit was driven in the direction of the incline for a distance of 7 ft. , the incline starting 4 ft. above floor level at this point. This allowed a chute to be constructed dumping direct into the tubs. Later this position was filled in and the lower four arches inserted to complete the job. The incline was driven approx. 20 ft. and a square junction put in on the level.

Opposite to this first incline a chamber 16 ft. 6 in. long lined with small arches was constructed to form an accumulator charging room. As the exit incline was also the upcast for the ventilating current all fumes were therefore taken direct to the surface with no danger of them finding their way into the main accommodation quarter.

To the left of the square junction a 35° incline 60 ft. long was driven to connect up with the base of a 26 ft. shaft above which was constructed a concrete observation post. Reference to this is made later. It was necessary to change direction twice by turning two right angles. To negotiate the first turn, a right angle curve put in on the level was designed – requiring five arches, the inside struts being 6 in. and the outside struts 2 ft. 9 in. apart. Later 36 special Arcuate sheets had to be cut and some difficulty was experienced when fixing them in position, to make a neat job. The second turn was made by putting in a square junction with a 5 ft. end bay on the blank side. Normal sheets and struts were used, and the turn was neat and easy to erect.

A 30° incline, 90 ft. long with a break of 38 ft. of level was driven was driven to the right from the first square junction to connect up with the Naval HQ at the surface. To facilitate this 577 Army Field Company R.E. cut through the floor of one of the rooms in the HQ and excavated to a depth of 7 ft. below surface level, placing an RSJ under the outside wall to avoid any chance of the building foundations being disturbed.

At first it was possible to advance two 2 ft. 9 in. bays per 8hr shift but as the inclines progressed it was necessary to employ several men shovelling to keep the chalk clear, and progress aimed at was one bay per shift. It was found that even dry chalk would not find its own way down a 30 incline, and in future it would be worth while preparing a substantially built chute to help the spoil on its way. A temporary chute was constructed but the weight of chalk soon wrecked the corrugated sheets, and before anything strong enough was erected, the incline reached the surface.

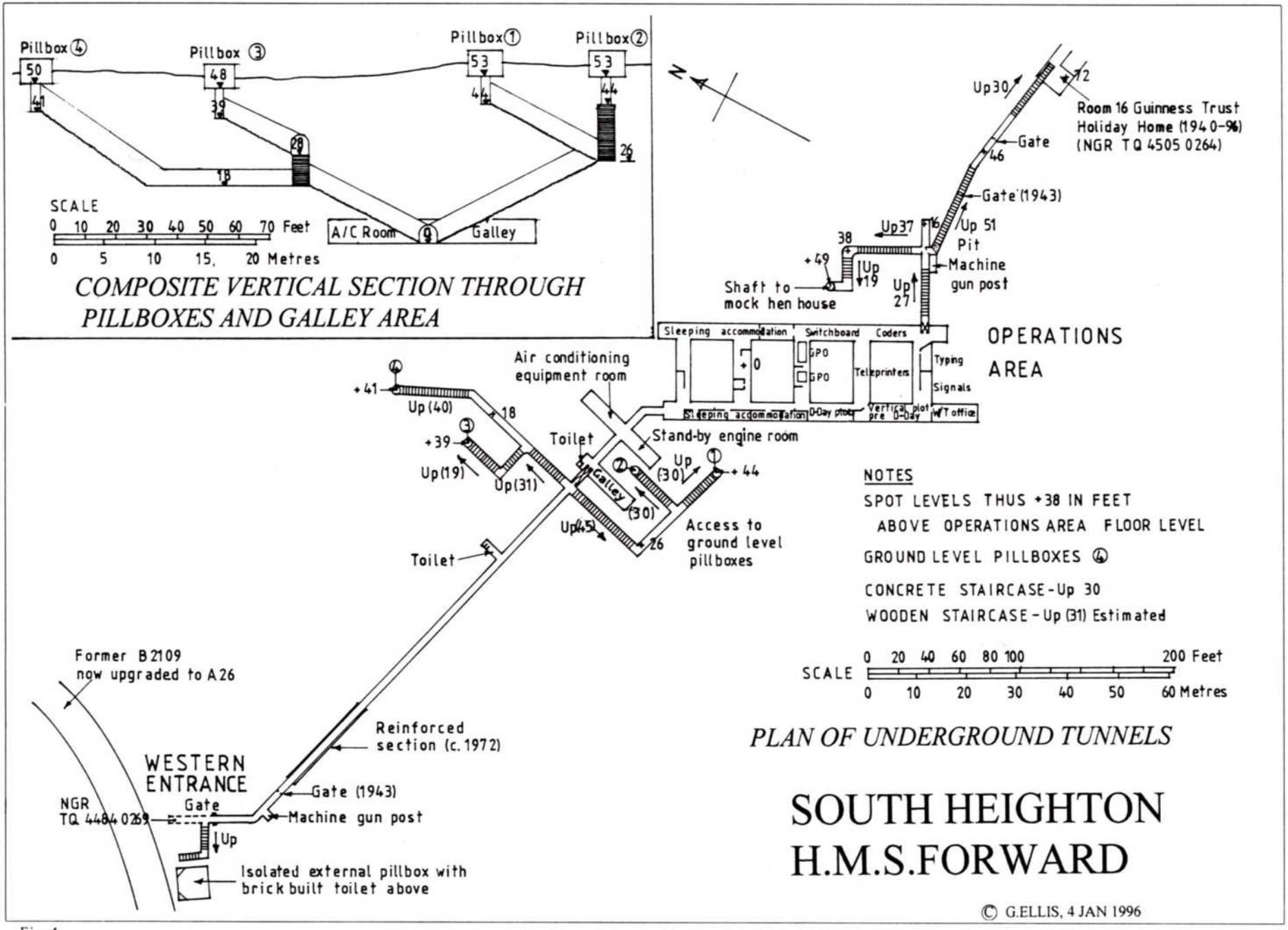
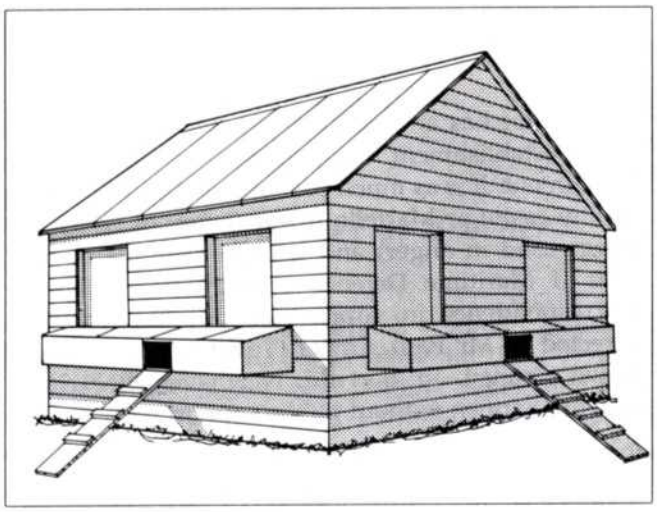

Pillbox ④
Pillbox ③
Pillbox ①
Pillbox ②
50
48
53
53
41
39
44
44
28
26
18
SCALE
0 10 20 30 40 50 60 70 Feet
0 5 10 15 20 Metres
A/C Room
Galley
COMPOSITE VERTICAL SECTION THROUGH PILLBOXES AND GALLEY AREA
N
Up30
72
Room 16 Guinness Trust Holiday Home (1940-96) (NGR TQ 4505 0264)
Gate
46
Gate (1943)
Up37
16
Up 51
Pit
Machine gun post
38
+49
Up 19
Up 27
Shaft to mock hen house
Sleeping accommodation
Switchboard
Coders
GPO
GPO
Teleprinters
Typing
Signals
Sleeping accommodation
D-Day plot
Vertical plot pre D-Day
W/T office
OPERATIONS AREA
Air conditioning equipment room
+41
Up (40)
18
+39
Up (19)
Up (31)
Toilet
Stand-by engine room
Up (30)
+44
Galley
(30)
Up (45)
26
Access to ground level pillboxes
Toilet
NOTES
SPOT LEVELS THUS +38 IN FEET ABOVE OPERATIONS AREA FLOOR LEVEL
GROUND LEVEL PILLBOXES ④
CONCRETE STAIRCASE - Up 30
WOODEN STAIRCASE - Up (31) Estimated
SCALE
0 20 40 60 80 100 200 Feet
0 10 20 30 40 50 60 Metres
PLAN OF UNDERGROUND TUNNELS
Former B2109 now upgraded to A26
Reinforced section (c. 1972)
WESTERN ENTRANCE
Gate (1943)
NGR TQ 4484 0269
Gate
Machine gun post
Up
Isolated external pillbox with brick built toilet above
SOUTH HEIGHTON
H.M.S.FORWARD
© G.ELLIS, 4 JAN 1996

Fig. 4



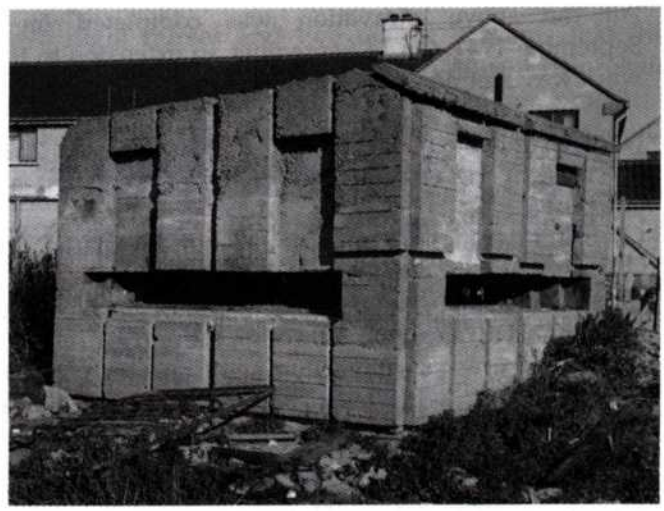


Fig. 5 Two views of the mock henhouse.

Left; as planned, including wooden cladding and detachable nesting boxes (concealing gun ports)
Right; as photographed, with the wooden cladding gone, in 1964 © G. Ellis

Breakthrough into the Naval HQ building was made at 1820 hrs 4 September 1941, an occasion that was well celebrated in the Wardroom.

On 8 July 1941, it was decided to construct a concrete observation post on the summit of the hill, and to connect this to the HQ by sinking a vertical shaft. First of all, three 9 ft. arches connected by two No.16 and two No.17 spreaders were erected over the centre of the shaft to act as headgear, to which pulley blocks were later attached.

An old wooden hut was then erected for the sake of camouflage, designed and shaped so that the observation post could be constructed under its cover. 24 in.-gauge tramway was laid to a point nearby where the chalk could be transferred to the dumpers. The size of the shaft was 4 ft. 9 in. square, and it was later lined with timber. The chalk was sufficiently strong to allow sinking to proceed to the depth of 26 ft. with little temporary lining. The chalk was excavated by hand pick and small miners shovel, spoil being raised in a basket by means of a pulley block attached to the headgear. At a depth of 26 ft. a horizontal gallery 6 ft. x 5 ft. was driven for 13 ft. supported by four timber sets. This gave cover to the men employed on lining the shaft when materials were being lowered and also made it easier later on to connect up the shaft with the incline.

The shaft and small gallery took six days to excavate, time and labour amounting to 48 man-shifts. The lining consisted of six frames, internal dimensions 3 ft. x 2 ft. 10 in. made of 9 in. x 3 in. timber placed at 2 ft. 9 in. centres with 9 in. x 1 in. lagging boards behind. The timber frames and lagging boards were cut on the surface, and the lining was built up from the bottom of the shaft. This made plumbing easy and no difficulty was encountered, the whole being inserted in thirty-two 8hr man-shifts. The bottom frame is supported on four 6 ft. pit props and capsils, the whole being well braced. The shaft lining came to within 6 ft. of the surface, which was the depth of the reinforced concrete foundation of the observation post. Two ladders were fixed within the shaft. 577 Army Field Company, R.E, constructed the observation post which was very effectively disguised as a chicken shed with live chicken in a wire-mesh enclosure around it (Fig. 5).

577 Army Field Company R.E carried out the internal linings and decorations of the tunnel. All the floors of the chambers and galleries were lined with pre-cast concrete slabs 3 ft. x 2 ft. x 2 in. thick. A thin layer of ashes was first levelled out over the sills, and the concrete slabs laid on a ¾ in. bed of cement and sand, strength 8:1 dry. Moisture from the strata set the cement. Laths 2½ in. x 1 in. were fixed longitudinally to the inside of the arches, onto which a layer of waterproof bitumen felt was attached. The final lining was of 3-ply board, which was subsequently whitewashed. (See sketch). One chamber was lined with Essex boarding. All sub-dividing partitions were constructed of breeze blocks 17½ in. x 4½ in. x 9 in. with studding.

The Canadian Boring Company put in four 3 in. and two 12 in. boreholes. The small holes were for the electricity supply cable and wireless aerial feeders and the large holes for ventilation and generator exhaust. No difficulty was experienced, and the strong flints had no detrimental effect on the verticality of the boreholes.

All the above excavation was completed on 5 September 1941. On 14 September an extension to this work was commenced to provide:-

(1) a chamber 8 ft. x 9 ft. x 27 ft. 3 in. situated 20 ft. west of the engine room chamber for a first aid post,
(2) one machine-gun post at the bottom of the exit stairs designed to fire up the latter,
(3) one machine-gun post on the first bend of the tunnel entrance to fire through the entry,
(4) four stairways connecting with surface concrete pill boxes, with level landings to be used as sleeping accommodation for the gunners. Inclines to be 35° with steel liners throughout.

Mechanical Aids

All the excavation work was accomplished using Reavell Pneumatic Picks HP2R. Up to four picks were satisfactorily used with one 100 cu. ft. Broomwade Compressor, but during the peak period from 12 July to 16 August, seven picks were employed requiring a 200 cu. ft. Climax Compressor. Records show the compressors ran for a total of 2127.5 hours consuming 1907 gallons of fuel and 533 pints of lubricating oil.

Hudson 20 cu. ft. capacity "U" shaped side-tipping tubs running on 24 in.-gauge track were used for removal of spoil within the tunnel to a rail-head twenty feet outside the tunnel entrance. Their fixed wheels gave some difficulty negotiating the 135° bends. Calculations show that these tubs made return trips amounting to over 1280 miles, equivalent to a journey to Inverness and back. They didn't always return empty. There were copious quantities of ironwork, bricks, breeze blocks, flag stones, ballast, sand, cement, and other materials to be conveyed inwards. There was no provision for storing any constructional materials outside of the tunnel.

Chaseside 60 cu. ft. forward-tipping dumpers were used for the disposal of spoil from the site. An estimated 3730 cubic yards of spoil was handled on as many as 2500 mile-round trips for the dumpers always ran under-loaded for fear of depositing chalk on the surface because of enemy aerial reconnaissance.

The first phase of excavation commenced on 28 May 1941 and finished on 5 September. During this period an average of 39 men worked a three 8hr-shift rota on 86 days out of 101 expending 2486 man-shifts below ground and 907 man-shifts on the surface. The second phase ran from 14 September 1941 to 4 November, expending a further 794 man-shifts below ground and 105 man-shifts on the surface. One additional statistic of interest is that for their efforts, the men were paid two shillings (ten pence!) per day! Although it must be remembered that in 1941, two shillings would have purchased twenty cigarettes or three pints of beer.

The author has an ambition to have what remains of this establishment scheduled as an Ancient Monument. It is as much part of our National Heritage as any castle or Martello tower (many of which were never used in anger) and it is an example of World War II Maritime Defence strategy and technology. Correspondence in support of this aim should be directed at Mr Paul Archer, Town Clerk, Newhaven Town Council, 18, Fort Rd, Newhaven, BN9 9QE. It will not happen without public support.

REFERENCES:

Imperial War Museum Photographs H.14501 – H.14508 inclusive. Taken by Lt. Tanner 2 October 1941 at *'an underground operation control centre somewhere in the SE Command'*. Rare and unique selection of pictures giving a coup d'oeil of work in progress and state of completion at six recently identified locations by that date.

The author of this article has written a book and produced a seventy-minute video entitled *THE SECRET TUNNELS OF SOUTH HEIGHTON*. These describe in detail the revelations produced by a site survey, and visits to the Public Records Office. Interviews with military and civilian veterans who served here during the war provide authentic information about unrecorded matters concerning the equipment, accommodation, procedure, and administration of the establishment.

The book is published by SB Publications, Seaford, ISBN 1 85770 101 1. Both are available from the author, 11, Fairholme Road, Newhaven, BN9 0NY. The book costs £6.50 plus £1 (UK) p&p; the video, in VHS PAL format (other formats available), costs £9.99 plus £1.50 (UK) p&p.

A model of the labyrinth and together with the Visitors book containing the signatures of many distinguished visitors and many other artefacts from the establishment are on display at Newhaven Local & Maritime Museum, Paradise Park, Avis Road, Newhaven, BN9 0DH. (tel: 01273 612530). The museum is open every Saturday and Sunday afternoon, and Bank Holidays, with extended opening during from April to October.

BEVENDEAN ISOLATION HOSPITAL, BRIGHTON

Hugh Fermer,
with a postscript by Pat Bracher

The story of Bevendean Hospital, originally called the Brighton Sanatorium, began early in 1881. A letter from the Workhouse Master at Elm Grove dated early in 1881, informed the Sanitary Committee of Brighton Corporation that there was a depressing need for more accommodation for smallpox victims. There were, he said, only five places now available at Elm Grove. This was repeated in a further letter to the Committee in May 1881. On 31 May 1881 the Sanitary Committee resolved that 'The Surveyor do forthwith erect a temporary building to be used as a sanatorium on part of the land acquired by the council as a site for such an establishment.' This resolution went on to say that wards were to be fitted up for not less than forty patients and requested the Medical Officer of Health to report on the staff that he required.

The site referred to in the Sanitary Committee resolution was on the Downs at the back of the town. It was ten acres in extent and 326 feet above sea level and it sloped towards the west and south in the direction of the sea. It was acquired by the Corporation in 1881 for £5,000 subject to restrictions preventing the Corporation from erecting buildings for the infectious sick except on a limited portion of the site. These restrictions were removed in 1895 by a payment of £1,000 as we shall see later. The plot of land was said, in a contemporary issue of the *Brighton Gazette*, to stand 'on the slope of the Downs that leads from the Lewes Road near the Bear Inn, to the windmill near the racecourse.' Today the site is bounded by Bevendean Road and Bear Road.

A smallpox epidemic in London during the year 1881 caused Brighton Council to expedite the project, and Patching and Sons, builders, were contracted to build the hospital, for which purpose the Council borrowed the sum of £15,000. The initial stage of the project was for three main buildings all of wooden construction with the roof covered with felt. These buildings consisted of an administration block and north and south wards and were completed in ten weeks. The contractors demanded an extra £100 for meeting the deadline date.

By September 1881 the hospital must have been open because a list of patients admitted and details of the staff appointed appear in the Council minutes. There was a medical officer, matron, porter, two day nurses, two night nurses and two maids. It seems that the hospital opened without the full complement of staff because the minutes refer to the sharing of a medical officer from the Workhouse which the Guardians Committee seem to have agreed to. A Mr. and Mrs. Eden were engaged as Master and Matron at a salary of £2.10s per week with uniform and rations. The nurses were engaged at a salary of £1.10s per week with food provided. A cook is also mentioned at a salary of £25 per year, so she presumably lived in.

The expected smallpox epidemic did not materialise but the speed at which the hospital was built did mean that although the basic buildings were completed, there was still much to be done. Since no mention was made of heating until December 1881, it must be assumed that some form of solid fuel stoves were used for the winter of 1881. On 8 December two proposals for heating were considered; one a steam heating system, and one which used hot water piped round the outside walls by 4 inch diameter pipes with a boiler under the ward kitchen. It was described as heating 'in the same manner as a greenhouse is heated'. The steam heating system was adopted and was installed by a Mr. George Jennings of Lambeth at a cost of £250.

In the winter of 1881 an ambulance for the hospital was requested because the use of the ambulance at the Workhouse was not satisfactory. Hove Commissioners requested accommodation for smallpox patients from Hove at the Brighton Sanatorium; but this was refused on the grounds of insufficient space.

During the next two years the hospital was gradually improved and extended. A corrugated iron building, used for a Health Exhibition in Brighton in 1883, was erected at the hospital to do duty as another ward, and an additional building was obtained for use as a store room for linen. In 1883 a telephone line was laid between the Town hall and the hospital. At this time the number of patients treated seems to have been quite small. Only three or four names appear on the lists submitted at the meetings of the Sanitary Committee. The turnover of staff seemed to be very large, most being dismissed. There is a note regarding a maid promoted to nurse, with no mention of training.

By 1885 there were reports of trouble with the maintenance of the buildings. Rain was said to be beating through the roof in three of the wards in January 1885 and after this date there was an increasing need for repair and refurbishment, leading the Brighton Council to eventually consider a completely new hospital. The number of patients had increased considerably and a number of extensions

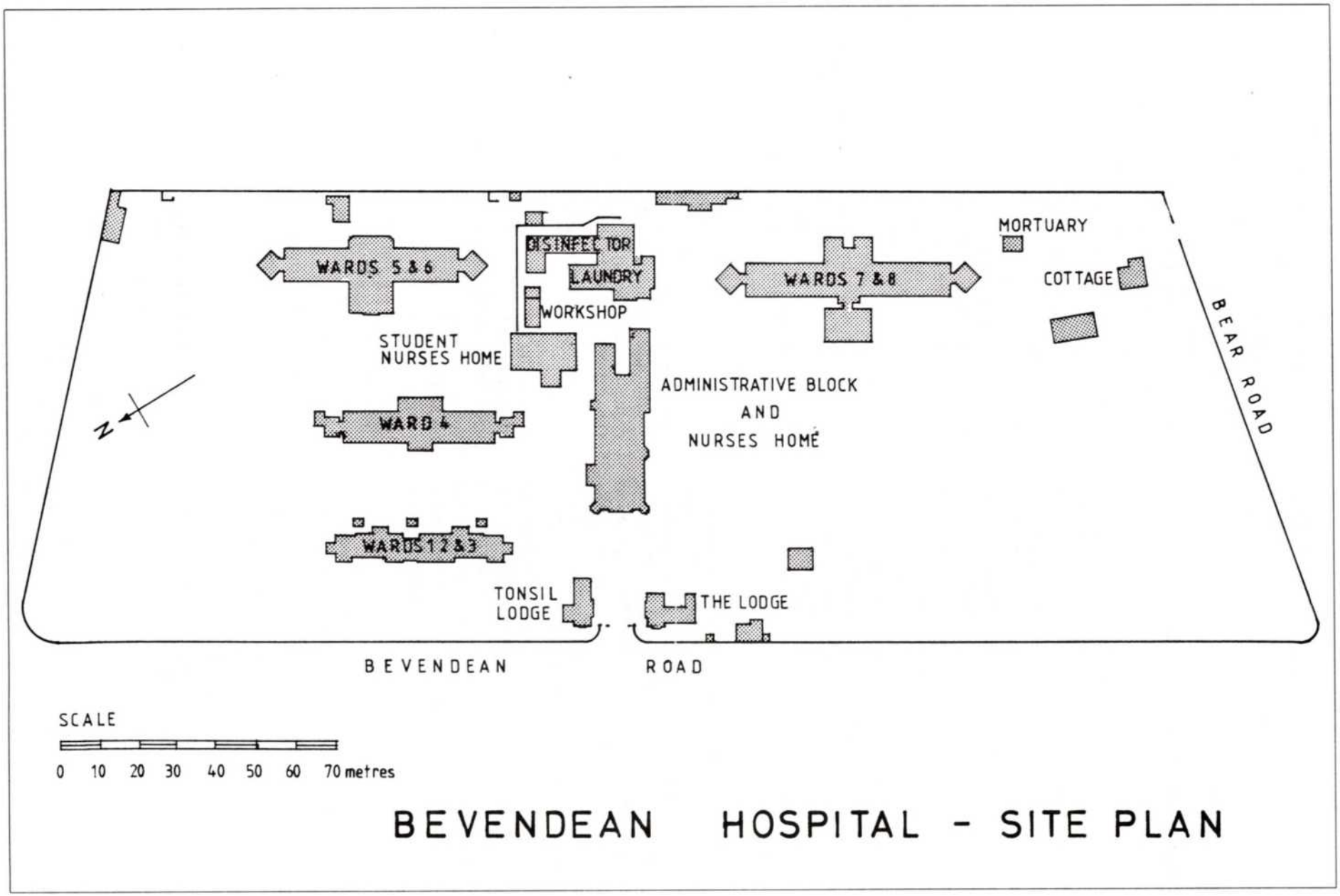

WARDS 5 & 6
DISINFECTOR
LAUNDRY
WORKSHOP
STUDENT NURSES HOME
WARD 4
ADMINISTRATIVE BLOCK AND NURSES HOME
WARDS 7 & 8
MORTUARY
COTTAGE
BEAR ROAD
WARDS 1 2 & 3
TONSIL LODGE
THE LODGE
BEVENDEAN ROAD
N
SCALE
0 10 20 30 40 50 60 70 metres
BEVENDEAN HOSPITAL - SITE PLAN

Fig. 1

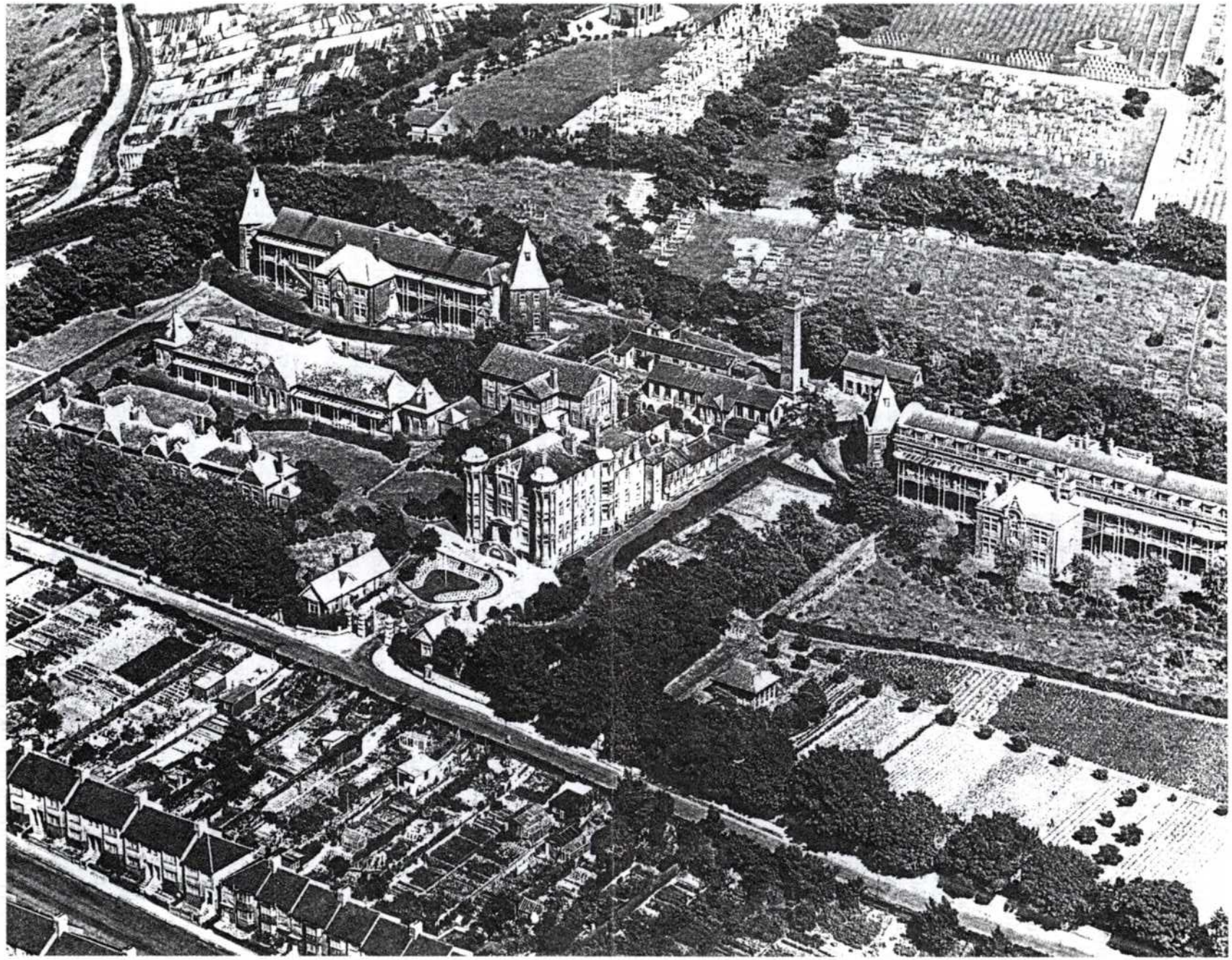


Fig. 2 Aerial View of Hospital

and improvements had become necessary including a disinfecting station, a porter's lodge, and a mortuary. It is interesting to note that at this stage the hospital had cost just over £16,000 which is not very different to the original estimate of £15,000 upon which the Council based their borrowing requirement.

By the end of 1886 the first phase of the hospital refurbishment was virtually complete. Main drainage to all wards and the administration block had replaced the old cess pits. The gardens and roadways had been laid out by the Parks Department at a cost of £183, and the perimeter was walled and gated.

In February 1889 the Medical Officer of Health and Philip C. Lockwood, the Borough Surveyor, recommended that a full scale steam laundry be installed. This was to have a Cornish boiler 12 ft. long and 5 ft. diameter. A 4 hp vertical steam engine was to drive the shafting and pulleys for the washing and ironing machines and the pumps for hot water and steam. The specification which ran into many pages reveals that with its steam box mangle and steam powered ironing table it must have been one of the most up to date steam laundries of its time. It was in fact the only major part of the old hospital to be used long term when the new hospital was built in 1898. It is said to have cost when completed in 1890 the sum of £1843.13s.1d, which considering that the whole hospital with land and all services cost about £16,000 was a very large sum of money indeed.

During the remaining years of the old hospital, that is until 1898, there is a steadily increasing list of requests for repairs to the buildings and ultimately a report which stated that more accommodation must be found for the patients as a matter of great urgency. There had already been action by the Council regarding the request for more accommodation. They had hired two portable buildings as used at a Portsmouth hospital, but they were not very satisfactory and the hire was terminated after a year. This new request together with the bad state of the existing buildings meant that some form of new hospital must be built, and in October 1893 it was resolved that a deputation from the Council would attend the Works Committee meeting and that the Borough Surveyor be assisted so as to present plans for a new hospital as soon as possible.

There was a big problem regarding the extension or rebuilding of the hospital on the present site. There was a restrictive covenant on the land which prevented the building of accommodation for the infectious sick except on a small part of the land. A sub-committee formed to look into possible sites saw land at Hollingbury Copse and other locations but recommended that if possible the restrictive covenant should be bought out and the Bevendean site used. On 7 October 1894, Alderman Blaker wrote to the Town Clerk accepting the sum of £1,000 for the release of his interest in the restrictive covenant on the land. He agreed to spend the £1,000 thus :-

£400 for a clock & tower in the Blaker Recreation Ground.

£600 for the laying out and improvement of the facilities in the same recreation ground.

The Blaker Recreation Ground was a piece of land covering 4.44 acres between Preston Drove and Stanford Avenue. It had been a gift to the town from Sir John Blaker in 1893. The clock tower and the recreation ground still exist.

The restrictive covenant having been removed, work on the new hospital was expedited, and in October 1894 the Sanitary Committee approved the detailed plans for the buildings prepared by the Borough Engineer and the Borough Surveyor. The plans were for :-

An administrative building
A one ward building
An isolation block
A discharge block
A porter's lodge (Fig. 1)

Brighton Corporation had already been in touch with the Local Government Board regarding a loan of £28,000 needed to build the new sanatorium. In September 1895 the Local Government Board wrote offering a loan of £21,500 on condition that the Corporation met certain conditions. The building containing the steam disinfecting apparatus was to be moved from its present position as it was too near the boundary of the site. The Board would not permit the treatment of cases of smallpox and other diseases simultaneously in buildings on the same site and stipulated that the corrugated iron building must be taken down within a period of five years. Finally the north and south wooden pavilions must be removed, one as soon as the new pavilion was built and the second as soon as any other pavilion was built.

In September 1896, the Committee accepted the tender of Messrs. Peters & Son of Horsham for £19,775 and work was begun in November 1896.

Because the Local Government Board had forbidden the treatment of smallpox within the Bevendean complex as a condition of lending the money, the Council started looking for a site in an isolated place for a smallpox hospital. After looking at a number of sites it was agreed by the Council that the house 'Hulking Grange' should be purchased with twelve acres of land and rights to common pasture on 150 acres known as Tenantry Down within the manor of Perching. Unfortunately the house and barns were demolished sometime just after the 1939 - 45 War.

Fig. 3 The Lodge

Fig. 4 Administration Block and Nurses Home (to rear)

Fig. 5 Wards 1, 2 & 3

Fig. 6 Mortuary

The work on Bevendean was largely completed by early in 1898 and the opening of the new hospital was set for Thursday 27 October of that year. The opening ceremony was performed by the Mayor, Alderman Sir John Blaker. We are told that it was a windy, salty afternoon when the town's civic leaders set out to celebrate the opening of the new buildings. What was described as 'a very representative gathering' of citizens assembled to see the cab horses straining uphill taking local dignitaries and their wives towards the new straggling dark red buildings. They were the Mayor, gorgeous in the mayor's scarlet and ermine and gold chain of office. Alderman Harries, (the Mayor elect), officers of the Council, clergy, visitors and staff. They passed through a room laid out with ten tables of refreshments, to which presumably they returned after the opening ceremony. In his opening address the Mayor said that the buildings had been paid for and would be used by the public for the benefit of all classes.

A contemporary drawing of the hospital shows the buildings which comprised the first phase, and the ground contours which the contractor described as 'undulating', and which made the planning of a large building like the Administration block (Fig. 4) a little difficult. The site has a natural slope from east to west so that from the rear of the administration building to the front entrance there is a fall of over 12 ft. and the ground floor at the front becomes a semi-basement at the rear. The site also had a natural slope from north to south which made a great deal of earth moving necessary. This earth moving and the consequent terracing of the site made it exceptionally attractive however as it matured.

The views of the three main buildings (Fig. 2) show the high quality of the design. They were not greatly altered during the life of the hospital and were generally acknowledged to be very attractive buildings indeed. The discharge block and porters lodge were a little more utilitarian in design. The perimeter wall and the main gates should be noted as well as the laundry in the background. The laundry was the only building of the old hospital to be incorporated in the new.

The *British Medical Journal* for 5 November 1898 gives a description of the new buildings which is very comprehensive and an edited version of this description would perhaps not come amiss.

> "The buildings are built with red kiln facing bricks, relieved by Portland stone cills, lintels, copings etc. The roofs of the entrance lodge, discharge block, and the ward pavilions are covered with Boseley tiles; the roof of the administrative block is covered with Bangor slates. All the external walls are built hollow. The drainage of each building is entirely disconnected from the drainage of any other building. Each set of drains is also separately ventilated by its own special inlet and outlet ventilation services.
>
> All the buildings are made as nearly fireproof as is practicable. Thus in all buildings except the wooden pavilions, the floors consist of wood blocks laid on cement floors. In the ward pavilion the floors consist of terrazzo on top of the concrete floor.
>
> The buildings are lit throughout by electricity from the Corporation mains. All the buildings are connected with each other by a private telephone.
>
> The walls are lined with opalite to a height of 4 ft. 6 in. above the floor line; above this the walls and ceiling are plastered in Keen's cement, painted and finished flat.
>
> A disinfecting station has been erected, fitted with two types of steam disinfecting apparatus: one a Washington Lyons (superheated steam) apparatus, and a new Defries equifex apparatus (saturated steam under pressure) added as the whole of the disinfecting for the town is done here."

This article in The *British Medical Journal* goes on to detail all the sizes and details of the wards and other buildings which can be taken from the ground plan (Fig. 1). There is one item however which is interesting. The old hospital had a system of steam heating installed in 1882. The description of the new buildings however lists the heating of each ward and room and the means of heating is either open fireplaces or Shortland Manchester ventilating stoves. Perhaps the central system was not very satisfactory, although there is no record of any kind of problem.

The porter's lodge on the south side of the entrance gates contained one living room, one bedroom, a kitchen and a scullery. The patients' discharge block on the north side of the gates had a bathroom, undressing and dressing rooms, and a waiting room for the patients' friends.

At the time that the new hospital was opened the Council and the *British Medical Journal* are on record as saying that the eventual object was to build three more ward pavilions and to increase the accommodation in the administration building.

Some of the interesting features of the hospital included the main gates. These were of iron and were manufactured by Bruin & Co of Birmingham and the William Morris influence could be seen in the design (Fig. 3). The iron balustrade forming part of the staircase in the administrative building had touches of the Art Nouveau movement about it in the stylized plants that formed part of its basic decoration. One can

also attribute much of the preservation of the buildings to the unchanging nature of the work carried out in the wards.

The last brick pavilions were completed between 1902-03. The most recent major addition was made in 1967 when a modern diagnostic theatre and companion X-ray department were built. These were necessary so that the hospital could maintain and extend its diagnostic services to the Brighton area. Prior to this the only major building work appears to have been the construction in the 'Georgian' style of extra nurses accommodation adjacent to the main building before the Second World War. Towards the end of its life the hospital provided care for two basic types of illness, physical conditions and psycho-geriatric conditions. For the physically ill person a hundred in-patient beds were available which provided for patients suffering from the whole spectrum of medical ills. In addition, the theatre and X-ray department provided excellent facilities for the diagnosis of chest conditions. The hospital also afforded longer stay accommodation for twilight patients. There was exceptionally large bed spacing in the Sanatoria regime. This afforded a greater degree of comfort for the patient whilst allowing spacious working conditions for the medical attendants. Each bed in the hospital was curtained to afford maximum privacy for the patient. In December 1968 a new Day Hospital for Psycho-geriatric patients was launched. This new development proved a great success. The Day Hospital was housed in one of the original hospital wards which had been imaginatively redecorated and modernised.

POST SCRIPT

Pat Bracher

The Brighton *Evening Argus* of 12 April 1989 stated that in 1897 at Bevendean (which would have been in the original wooden wards) there were 450 patients, 74 with typhoid, 103 with diphtheria and 265 with scarlet fever.

In December 1950 Bevendean Hospital hit the headlines when two Brighton residents were admitted and found to be suffering from smallpox. While the town was searched for contacts the hospital coped with thirty-six cases and was sealed off from the outside world. Ten people died, six of whom were hospital staff. The outbreak was declared over after 43 days and on 6 February 1951 the gates were opened again and the staff given two weeks holiday while the hospital was fumigated. From that time the hospital dealt with more general illness, in particular chest problems.

By 1981 the fabric of the buildings was beginning to crumble, particularly in the administration block. The towers were permanently surrounded by scaffolding which kept them standing (Fig. 4). Staff complained that ceilings fell on them as they worked. Rain poured in everywhere and the wards, although clean, had not been painted since 1969. The glazed stone chipping terrazzo floors resembled crazy paving. Letters were sent to the *Evening Argus* complaining of the poor conditions and there were also complaints that the hospital was surrounded by cemeteries. The authorities explained that the nineteenth century hospitals were built near cemeteries to make less work for the horses pulling the hearses. Despite these complaints staff, patients and visitors all agreed that the hospital had a caring and happy atmosphere.

In 1987 the kitchen block was demolished and from then on food was cooked at Brighton General Hospital and transported to Bevendean. The hospital closed on 24 April 1989. The ten acre site was to be sold and the proceeds spent on the new hospital at Hove and a new ward at the Royal Sussex Hospital. The last part of the hospital to close was Willow Ward, the day ward for psycho-geriatrics which was to remain open until a new home for it was found in September 1990. The site was bought by Croudace Housing who planned to build 128 houses and demolition began in April 1993. Nothing is now left of the hospital except the high flint wall which marks the boundary of the housing estate.

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My thanks to the staff at both these establishments.

Plans, newspaper cuttings, letters, photocopies and photographs belonging to Hugh Fermer.

TANK ROADS ON THE DOWNS

Peter Longstaff-Tyrrell

Living and working around the Sussex coast and countryside for over 50 years the author often glances up at the South Downs to ponder upon the old cart tracks and byways that decorate the slopes. These tracks seem legacies of a distant past but are not always that ancient and many date back only to the period of WWII when the Downs were commandeered by the Army for the South Downs Training Area. At this time slumbering Sussex villages and countryside were transformed for all manner of exercises, communications, camps, gunnery practice, prisoner of way camps, emergency airfields, decoy sites, stores and dumps.

Prior to the outbreak of WWII a number of agreements were entered into by the East Sussex County Council under Section 34 of the Town and Country Planning Act 1932, with owners of land on the South Downs, restricting all building. The majority of the landowners waived all claims for compensation and acted in a most spirited manner. Then in late June 1946 the ESCC issued a general note regarding Military Roads on the Downs that had been built in the war.

During the war a number of rough tracks leading up to the northern escarpment of the Downs were vastly improved by the Army whilst requisitioned. In some instances the tracks became bustling two-way roads, whilst others had numerous passing places. The metalled roads ended at the top of the escarpment and the ESCC, with prewar experience in mind, were aware that motorists in dry weather would be able to drive almost anywhere along the Downs now that access had become established. The precise status of these ancient routes may not always have been known, many of them having been highways of a sort since the Roman period and earlier. However it was thought probable that the majority had not been used by mechanised civilian transport and generally they fell into the bridle road or drift road categories.

It was not considered desirable to urge that all the metalled surfaces of these much improved approach roads be removed when the area was de-requisitioned, due to their potential use for farmers and the cost of lifting the surface and foundations that made up the roads. Generally it was envisaged that certain roads could be left to revert to nature, although some could well be maintained by the various estate owners and that to place a fence or ditch at the approach to the Army roads would be sufficient to deter even the most ardent off-road adventurer. Ironically perhaps at this time there was a glut of ex-Ministry vehicles available at auction. In subsequent decades development of leisure activities and the 1980s boom of fashionable Jeep-type transport has generated a new era in off-road activity thus the 1946 plans to deter motorists from driving on the Downs could be said to be of considerable foresight.

In April 1946 the East Sussex County Council compiled a list and wrote to certain prominent landowners, estates and their legal representatives and enquired if any metalled Army roads had appeared on their land since being occupied by the military under the Defence Regulations. Where military roads followed a new alignment there would be no difficulty as there was no public right of way and that if landowners wished to retain any such road they simply had to install a locked gate at the road entrance. However in most cases it was ancient bridleways and cart tracks that had been vastly improved for military use. Thus the county authorities sought to establish where the roads had been constructed or greatly improved under the Defence Regulations and whether it was considered that the right of the public to use these roads for any purpose: i.e. were they entirely private roads or merely improved footpaths or established bridleways. This research project is based upon that 1946 official report, together with subsequent investigations and fieldwork.

Throughout the research for this project the word 'bostel' appears in varying forms of spelling. The spelling of this old word varies; bostel, bostell, bostal, bostle and even borstal. In the book *Spirit of the Downs*, in 1909, Arthur Bennett writes "steep sided valleys wind for miles among the hills while occasional 'borstals' or old sheep paths lead from base to brow". *Chambers Twentieth Century Dictionary* states ... 'borstal, borstall, a way up a hill, still used in the district of the Downs'.

Royal Engineers laying a labour intensive WWII tank road on the remote South Downs.
(Courtesy of the Royal Engineers Museum.)

Interestingly the main profusion of bostel based tank roads remain in East Sussex and in the following account the spelling used in the original sourced account has been used for authenticity.

The term 'tank road' is a general term for all forms of military improvised routes around the Downs. Listed below are the principal tank roads accessible today and reports on their location, status and condition. Most have been left to revert to nature, whilst others have been adapted for agricultural uses. There are of course other examples of military roads around the county, although many are fragmented sections only, or in retirement on old airfields, radar or camp sites and on private land upon which access is not encouraged.

The map references included apply to the start of a tank road as it exists today. Seeking out tank roads in the countryside can be addictive, but not all concreted farm tracks are military made. A local authority or the supply industries may be responsible for that obscure metalled byway, quite apart from farm and estate owners themselves.

KNOWN WEST AND EAST SUSSEX TANK ROADS

1. **Springhead Hill, Storrington.**
TQ 065133. Off Amberley to Storrington B2139. Parish of Parham.
A splendid example of a farm lane widened, metalled and remaining up to the Downs. Can be appreciated at Springhead Hill near Storrington in West Sussex. Canadian troops were stationed in vast numbers throughout Sussex during WWII and the downland above Storrington was a training and tank testing ground.

In late 1993 Martin Mace instigated the recovery of a Churchill tank that had been used for target practice by the Canadians and when redundant had been buried upside down close to the current South Downs Way. Soil erosion had caused the underside of the tank to become exposed and to foul agricultural equipment. This led to a group of Territorial soldiers from Northampton excavating the site and uprighting the tank, near where it resides at TQ 072122.

Countryside at Kithurst Farm, up to the Downs, is still designated as the 'Kithurst Ranges – Danger Area'.

2. **Truleigh Hill, Upper Beeding.**
TQ 213082. Off Mill Lane, Shoreham-by-Sea. Parish of Upper Beeding.
Military metalling of the farm track north of New Erringham Farm served a multiple purpose with the busy Chain Home Low radar station at Truleigh Hill and all manner of Army and Royal Air Force needs for access to this part of the vast South Downs acres. The 10 feet wide tarmac road, from New Erringham Farm, towards the former radar station is in fine managed condition and dies out just prior to the Youth Hostel Association building in a spinney at TQ 219104. The remote YHA building was originally erected as a nudist camp in the 1930s, prior to being taken over by the RAF in WWII. A steep incline southeast from the A2037 – using the bostal from TQ 200101, Castle Town, Upper Beeding – was also utilised by the Armed Services, but today it is heavily rain rutted and littered with a rubble surface only.

3. **Devil's Dyke, Brighton.**
TQ 265121. Devil's Dyke to Poynings road, Parish of Poynings.
In late May 1946 the Devil's Dyke district de-requisitioning had been discussed and the ESCC wrote to the Secretary of the Dyke Golf Club, that was not functioning at the time, that they were bringing all pressure possible to bear on the military to clear the Downs within the administrative County. The Club Secretary however did ascertain that although the area had not been cleared there were, perhaps surprisingly, no military roads on the golf course. There may have been Army use of rough tracks, but they were hardly distinguishable by then. There was just one little used bridlepath that crossed the course which at the time for re-requisitioning was enquired into.

Reference was made by a landowner at 'Fox Ash', Poynings, that there were no such military roads on her property and that she was in complete agreement with the general opinion that any remaining roads should not be available to motorists.

Another mention is made to a bridleway close to Poynings Church that was used for military access to the Dyke hollow, The military apparently widened this bridleway and cars 'were now constantly making use of it'. The landowner urged that the pair of gates, formerly across the bridleway, be reinstated and vehicular access be denied forever. Several paths near the church have been explored and extensive use by vehicles seemed unlikely.

Dyke Lane in Poynings village is short, almost flat, and currently marked 'Bridleway over Private Land'. The surface is earth and grass covered with no signs of hard core. The seven foot wide track dies out at the foot of the National Trust owned Dyke Hill, the path then rising steeply on a recently treated chalk surface, again seven foot wide. An earlier adjacent track is evident on the long steady climb up the Dyke hillside. The incline would be quite enough for a present day off-road vehicle to contemplate and it seems that basic vehicles of 50-plus years ago would be unable to

complete the climb – if this was indeed a former military road.

4. **Clayton Holt, Hassocks.**
TQ 310137. From Underhill Lane, Clayton. Parish of Clayton.
Living at Keymer for many years in the 1970s the author was initially intrigued by the locally named tank road, or tank track, running up from the waterworks pumping station in Underhill Lane to the South Downs east of the Jack and Jill windmills.

According to a December 1945 document from the Ministry of Town and Country Planning Office in Tunbridge Wells the metalling of Clayton Holt was to be taken up and the road allowed to revert to its original condition. However the surfaced track remains to this day, gradually reverting back to nature and signposted as a bridleway to Patcham. It is just seven foot wide in places and is at last showing signs of its brick and rubble base; the main section is covered by a form of hogging. It is comparable in this feature to the narrow Little Dene tank road at Beddingham Hill near Glynde. Grass is encroaching on much of the Clayton track that climbs steeply amid park-like surroundings to the top of the Downs where it dies out gracefully. Vehicular access is not possible due to a locked gate.

Period correspondence indicates that ownership of Clayton Holt changed hands several times during WWII. Communications with the Burgess Hill Water Company and to Vic Lewis, the husband of (Dame) Vera Lynn, the then owners of Clayton Holt – whose Whitelands Pumping Station and home bordered the track – agreed that public vehicle access to the Downs by way of the narrow path should be greatly discouraged.

A wartime map at the Public Record Office also indicates that Mill Lane TQ 297135, from the apex of the Clayton road, was adapted and metalled as a military road up to and past the windmills.

5. **Plumpton Plain, Lewes.**
TQ 363132. Off Lewes to Ditchling B2116. Parish of St John (Without).
The group of military roads at Plumpton, on to the former South Eastern Training Area on the Downs, is perhaps the most interesting of the old tank roads and was the subject of some lengthy letters with the ESCC in Lewes from the owner at Oditune Place, Plumpton, whose family owned much of the neighbouring pasture and downland.

Two roads were in more or less constant use by the military, plus the track to Novington Pit and The Beeches from TQ 367131 which although not formally requisitioned was nevertheless frequently used by the Army.

The pair of roads in most constant use were the road up from the B2116 thoroughfare to the summit just west of Blackcap, known as Warningore Bostall from TQ 379130. This route had very little attention originally and by mid-1946 was 'very bad', although the route was understood by a local landowner to be a public carriage road to Falmer.

The major military road at Plumpton is the metalled road at TQ 364132 from the Half Moon Inn to the Downs northeast of Streat Hill Farm, called Plumpton Bostall. A massive amount of finance and labour must have been expended on this wide track, the road reputed to be a public carriageway, though in 1939 very rough, overgrown and ill-drained and surfaced.

This impressive Plumpton Bostall tank road, from Plumpton Plain off the Downs towards Plumpton Lane near the Half Moon Inn, is inaccessible other than to farm traffic, horse riders, cyclists and walkers. The bridleway varies from 11 to 23 feet wide and has had only nominal maintenance apparently. The first sections, lower, remain concreted and in very sound condition with rutted indentations to aid traction. A sign stating 'farm tractors only' is posted at the base of the steep track and the upper sections of the ascent are still bordered with tarmac patches, and surface brick base rubble litter this access route to the South Downs Way.

Novington Bostall was described by the owner as 'my private road' to Novington Chalk Pit and was extended to enter Warningore Bostall a short distance below the summit. When war broke out this bostall was surfaced well enough to carry light vehicles to the family's house on the crest, since burnt out by the military. These intriguing interlinking farm tracks and footpaths are heavily overgrown or grassed over and offer little to lure any illegal motorists.

The landowners involved bordering the area were the Chichester Estate at the summit, East Sussex Agricultural College (that during WWII trained Land Army personnel), the Powell Edwards family, the Shiffner Estate and the owner of Streat Hill Farm. Other owners are listed as Colonel W. Churchill Hale and Mrs Spicer of The Cottage, South Plumpton – so the situation regarding rights of way was complex.

6. **Newmarket, Lewes.**
TQ 373091. Off Brighton to Lewes A27. Parish of St Anne (Without).
The owner of Littledown Farm, Newmarket, replied to the 1946 ESCC tank road circular stating that the short metalled track under the railway, through his land, was a bridleway.

The lane, between the Newmarket Inn and the BP Filling Station, had been concreted a short distance up to the railway and as the route served some cottages the landowner approved the metalling.

7. **Rodmell, Lewes.**
TQ 411066. Off Lewes to Newhaven A275. Parish of Rodmell.
The long track to Breaky Bottom is a public right of way and is marked the White Way on local maps. It commences by passing through the entrance to Northease Farm, just north of Rodmell. The tidy concrete road rises to a wide level section of unmade road and is marked on official Pathfinder maps as a road used as a public path.

Vehicles use a large lay-by as a car park and vehicular progress further along the road is not advised due to the rough surfaces remaining. Unlike other established tank roads at Firle and Bopeep there is no car park at the end of the lengthy White Way that continues in various degrees of deterioration towards the South Down's Way, that bisects it, and Breaky Bottom Vineyard.

8. **Telscombe, Peacehaven.**
TQ 405038. Off Lewes to Newhaven A275. Parish of Southease.
The wartime extension of the narrow downland metalled road from Southease to the remote Telscombe hamlet, runs towards Telscombe Tye and is shown on some current maps as a bridleway although at the site only the neighbouring track to Cricketing Bottom is signposted as a bridleway.

The straight and narrow military laid track is in sound condition, with little indication of maintenance evident. There are remnants of patterned brick road foundations and some brick and concrete debris. The neat track is 10 feet wide and has views towards Mount Caburn, Beddingham Hill, Seaford Head and Belle Tout. The track ends at a cattle grid and gate close to a reservoir, a wide downland track inland to the right bears no sign of metalling. No remedial action was thought necessary in 1946 regarding this tank road, it was to be left to revert to its original condition, although subsequent farm use has led to it being maintained.

9. **Tide Mills, Seaford.**
TV 461003. Off A259 Newhaven to Seaford coast road. Parish of South Heighton.
Military metalling of Mill Drove high street at Bishopstone Tide Mills took place during Army occupation of the hamlet as an urban warfare training site. Mill Drove was needed to take troops and transport to the Continent.

The once bustling and resourceful mill community had by that time been replaced by railway and farm employees and the advent of WWII finally ended civilian occupation at the Tide Mills where William Catt pioneered tidal milling techniques in the county in the eighteenth century.

10. **Little Dene, Beddingham.**
TQ 457002. Off Lewes A27 to Polegate road. Parish of Beddingham.
The lengthy military laid track past 'Little Dene' up Beddingham Hill, on the Glynde Estate, was again officially to be left to revert to its original condition. A gate was to be provided above the junction with the track to 'The Furlongs' and soil spread over exposed chalk if practicable.

The steep tank road is comparable in its features to the tank road at Clayton, although this arduous narrow lane is much less used by the public. No vehicular access is allowed. The track is approximately 13 feet wide with a few passing places and surfaced these days in loose hogging and rubble at the initial stages. Nominal maintenance appears to have been provided and strangely the higher, more exposed, stretches remain in a more sound condition. Views extend to Glyndebourne, Beddingham and westerly towards the South Downs and inland across the Weald panorama.

In Glynde village from TQ 458088, near the railway bridge, an ageing concrete road runs towards Balcombe Pit and is reputedly an alternative route should the bridge be out of action following enemy attack. The vast Balcombe Pit was created for the excavation of lime for building and construction work, prior to concrete being available, During WWII rail-mounted guns, of 12 inch bore, were camouflaged in the goods yard at Glynde station. Owing to the limitations of the existing road bridge the emergency level crossing for military use was provided on the down side of the station between 1943-1947.

11. **Firle.**
TQ 477076. Off A27 Lewes to Polegate road, Parish of Firle.
Normally known as Firle, but officially West Firle. Postwar the tank road starting beside the flint school house was to be left to revert to its original condition, however Lord Gage indicated that the road had been metalled prewar and was a public right of way to the top. The ESCC had stated that a gate could be set up by the cottage just south of 'Newelm' and soil spread over all exposed chalk if practicable.

The tank road rises in a stepped fashion up to the waterworks property on the Downs. This impressive public highway varies in width from 15 to 21 feet and is well used and maintained, rising to a popular large car park. Views include Mount Caburn and towards

Beddingham and Ditchling and take in the novel Firle Tower used by gamekeepers and as a lookout post by the Home Guard.

12. **Bopeep, Alciston.**
TQ 498054. Off A27 Lewes to Polegate road. Parish of Alciston.
This sturdy military road, on the Firle Estate, up to Bopeep was initially to be left to revert to its original condition. A gate was to be provided by the cottage south of Bopeep Farm and soil spread over exposed chalk if practicable. However some correspondence was exchanged between the Firle Estate as to farm use of the road and it has continued to be appreciated by the public ever since.

Public access to the Downs here can be approached by the metalled road just east of the Barley Mow Inn at Selmeston, marked 'By Way, No Through Road'. The 14 feet wide ascent of Bopeep, beside the Chalk Pit Rifle Club, shows signs of patchwork renovations. Views from the small car park extend to Arlington Reservoir, St. Michael and All Angels Church at Berwick and across to Willingdon Hill.

During the 1960s, and for many years, the Firle Hill Climb was staged there by the Bentley Owners' Club as amateur sports motorists tested themselves and their machines against the clock ascending the short, but dramatic, curved hill. Sadly a lady Jaguar driver died in a crash into the chalk pit and other incidents brought about the end of competitive motoring at Bopeep, Firle. The vast chalk pit is a legacy of 19th century excavations to create railway embankments on the marshy Lewes to Polegate railway line.

13. **Winton Street, Alfriston.**
TQ 517038. Extension of Winton Street. Parish of Alfriston.
Today the wartime tank road from 'The Sanctuary' is in unmade condition, it is chalky and rubble surfaced and is 20 feet wide ending at a gate. Whilst the old bridleway (named Roman Road) then bears left up past the chalk pit, the tank road rises right steeply on a lengthy former drovers path that is littered with hogging – as turf and natural ageing continues to take over this wartime road that continued on diagonally across the present cultivated field.

Residential development was envisaged for farmland south of the level section of the tank road bridleway from 'The Sanctuary', towards Winton Chalk Pit, by the Land Realization Company who acquired the land around 1946. Subject to aspects of planning agreements and legislation it was thought that the highway extensions would have to be retained and dedicated to the public, 'whereon motorists will be able to drive to the top of the Downs'. Presumably though the speculative legal writer in Brighton had not explored the steep track fully.

Fortunately in hindsight this building work never took place. The Clerk to the ESCC caustically referred to the long tank road over the Downs, created on old farm tracks, as 'amongst the worst eyesores which the War has caused in that area'. Only months earlier in late 1945 the Ministry of Town and Country Planning had detailed that the War Department were to be asked to remove the metalling entirely – thereby restoring the then gorse covered hill side to its original state.

Interestingly the upper sections overlooked a wartime K decoy site at TQ 507044, No. C91 dummy airfield lighting system and SF79 Starfish layout, resembling a fire following an attack on nearby Lewes. During WWII a massive howitzer was sited in the grounds of 'The Sanctuary' to protect the Cuckmere valley.

14. **South Hill, Seaford.**
TV 504986. From A259 Eastbourne Road. Parish of Seaford.
This most used of the Sussex tank roads up South Hill, from Chyngton Farm, remains firmly established and maintained as access to the popular country park.

Up on South Hill itself the concrete tank roads and trio of loops are now significantly reverting back to nature. A fourth loop can be found at the end of the long tank road, to the west terminating on the golf course, where a concrete loop is buried under the golf links and can be appreciated on aerial views of the site. The vast military roads and loops were officially to be broken up and the land restored to its original condition.

15. **Belle Tout, East Dean.**
TV 564957. Beachy Head to Birling Gap road. Parish of East Dean.
An Army concreted farm track, on private farmland, remains opposite Belle Tout lighthouse towards Cornish Farm – off the cliff top road extending from East Dean to Beachy Head.

An eye witness report in the *Sussex County Magazine* states that in 1941 'tanks were skirmishing all along the Downs' and about 200 yards east of Belle Tout a firing range was being constructed. It consisted of a light railway crossing the valley formed by two hills, on one of which stands the old lighthouse. The rails ran part of the way up this hill, finishing in a deep dug-out. Inside this was an old car – minus its tyres – and the back wheel was used as a winch to tow a life sized target of a tank along the rails. Soon afterwards firing began and by 1942 it was incessant from dawn to dusk, never stopping, not even on Sundays. Almost every kind of gun was in use, from cannon to light howitzers and training crews arrived in relays.'

All too often the 1841 Belle Tout landmark, that prewar had been the home of the eminent London brain surgeon Sir James Purves Stewart, provided a tempting target for exuberant gunners and the granite lighthouse was badly damaged. Eastbourne Corporation undertook a sympathetic restoration in the late 1940s to resemble the original lighthouse.

Writing in early 1998 from Dartmouth John K. Smith recalls as an 11 year old lad 'seeing a flat outline of a tank constructed of tubular steel covered in black hessian that ran back and forth on a rail below the lighthouse. Anti-tank guns fired across the valley at the target and Belle Tout provided a spectacular target. We visited gunnery and infantry training areas and had the Downs and military hardware left behind to ourselves'.

Fifty years after it was rebuilt after war damage the lighthouse was under threat again, this time from coastal cliff erosion. In December 1997 a bold plan to move the lighthouse was announced. By the following summer the property was to be strengthened, supported, and raised two feet on hydraulic jacks and moved 50 feet on sliding tracks inland on to the former croquet lawn at the site.

A former Land Army girl assures the author that the cliff top road extending from Gilbert's Drive, East Dean, round to Beachy Head was unmade prewar and the Army metalled the road to Birling Gap and it was later extended to Beachy Head.

16. **Butts Lane. Eastbourne.**
TQ 586022. Off Coopers Hill, Willingdon. Parish of Eastbourne.
The military extension by Royal Engineers of the chalk farm track to Butts Brow, Willingdon, on the outskirts of Eastbourne, took place from 1941 when the Downs there were used for tank testing trials. As Army activity expanded the top of the Downs were barred to the public, a busy training ground stretched between Babylon and Willingdon Hill and Winston Churchill visited training there when early Churchill tanks were being used.

The track must have been used for variety of uses over the years for military access to downland at TQ 580017. Incidents like the late December 1917 RNAS Polegate airship tragedy and the dramatic February 1944 USAAF B24 Liberator disaster, together with developments at the 1942 Willingdon Hill telecommunications centre, are serious reminders of wartime activity on the Downs.

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The author wishes to thank Ron Martin, George Peirce and John K. Smith for assistance in the compiling of this article. This article originates from research by the author for his book *Operation Cuckmere Haven* (1998).

HASTINGS EARLY POWER SUPPLY

Brian Lawes

THE NEED FOR ELECTRICITY

Although today electricity is important in our everyday life, in the 1870s gas was the source of both light and heat. To have a commercial future electricity needed to offer advantages over gas. When the British chemist Sir Humphry Davy produced electric arcs that gave off light, electricity was seen to have a future. A lot of development was undertaken in the 1840s when a number of incandescent lamps were patented. Sir Joseph Wilson Swan was a leading chemist, electrical engineer and inventor. In 1860, he invented an electric lamp using a carbon filament in an evacuated glass bulb. The American inventor Thomas Alva Edison produced his carbon-filament lamp in 1879. The American pioneer in electrical engineering, Charles Francis Brush (1849-1929), produced the first commercially successful arc lamp in 1878. During the following years various arc lamps were introduced.

The first practical arc lamp was installed in the lighthouse at Dungeness, in 1862. Towns along the East Sussex coast must have realised the potential of electric lighting by noting this brilliant new light source a few miles to the East.

THE FIRST POWER STATIONS

Hastings was one of the first towns to have a commercially viable power station. There have been several claims to being the first. To a certain extent that statement must be qualified by whether it was to generate, to supply the public or even just to survive for any length of time. In Sussex Brighton commenced commercial supplies at the end of February 1882. An article in *The Electrical Times*[1] indicated that Hastings was the first to run. This was questioned in a letter to the *Electrical Review* of 8 December 1922 which suggested the start date was in 1883. Both of these dates are suspect. The planning application made to the Hastings Urban Sanitary Authority for permission to build the Earl Street Station was made 27 May 1882. Unless this was retrospective, which is most unlikely, the station could not have been built in February. The *Sussex Express* in July 1882 recorded the first general meeting of the company which dealt with the problem of obtaining contracts in competition with gas. The account also states that they had raised capital "and obtained a site for their works". This clearly indicates the building was not yet complete. As Mr. F.J. Pasons was director of both the paper and the electricity company it is likely that the comment is accurate. By 5 October 1882 the works were reported to be in active operation, which would certainly fit in with the time scale set by the previous events. However the debate is somewhat academic. Beating both towns by several months; the Central Power Station at Godalming, Surrey would seem to have the best claim. It was operated by Calder and Barret from 26 September 1881. The Town council paid £195 to light the town for 12 months. Although it was probably the first it was also short lived and closed on 1 May 1884 unable to complete with the cheaper gas.

ELECTRIC LIGHT FOR HASTINGS

In January 1882 a meeting of "private gentlemen" was held to decide how best to provide electric light to the Borough of Hastings[2]. This seems typical of rather guarded and often late announcements on all that was being planned at that time. An orchestrated campaign was being waged against electricity by the vested interests in gas. At meetings, and in the press, the general approach of gas was to use experts to explain scientifically that electricity, is dangerous, is expensive and gas does everything better anyway!

This probably explains why the official formation of the company was only announced in *The Hastings and St Leonards News* on 3 February 1882, a few months before the station was operational. The report states the meeting in a local solicitors, Mr. F.A. Langham's, office was "for the consideration of the advisability of forming a company for the production of electric light in the Borough of Hastings".

BRUSH LIGHTING FOR HASTINGS

A Mr. J.G. Langham of Uckfield and Eastbourne had obtained from Hammond and Co., the concessionaires for the Brush Light for Sussex, the concession for Hastings and Eastbourne. The Hastings company would be allowed to produce light on the condition that the company should have a capital of not less than £10,000 and that one fifth of the shares should be allotted to the concessionaires so that they may share the fortune or fate of the shareholders. It was agreed to form the company with the capital fixed at £50,000 in 5000 £10 shares. The article concludes "We understand the gentlemen present agreed to take up shares in large amount."[3] Again there is no mention of who these "gentlemen" might be.

Not until four months after the registration of the company, at which time it was obliged by act of parliament to hold a general meeting, did details emerge. Present were Mr. H.M. Baker (chairman) with

Mr. F.A. Langham (secretary). Other well known names included Mr. Roddis (One of the founders of Plummer Roddis Ltd. whose department stores spread through the South) and Mr. F.J. Parsons (printer of the local paper and the *Sussex Express*). It was stated that although the capital was fixed at £50,000 only £20,000 was intended to be obtained and even that sum was not required. At that time only £6,000 to £7000 had been raised.[4]

THE EARL STREET STATION

The original plant generated a potentially lethal 2,000V supply from Brush dynamos (Fig. 1) shaft driven by underfired locomotive type boilers. The supply to customers' premises was also 2,000V so lighting was by incandescent lamps connected in series.

In August 1882 the town council agreed to a 12 month experiment for lighting several local streets including the sea front. By 5 October 1882 *The Hastings and St Leonards Advertiser* reported that "The electric light works is in active operation and within the next few weeks it is probable that churches and private establishments will be lit."[5]

Two weeks later the same paper[6] reported that the electric light company were requesting the consent of the local authority for an application to be made to the Board of Trade to supply electricity under the Electric Lighting Act of 1882. The reason for this was either local authorities or private undertakings could apply but the private sector could only do so with the permission of the local authority. There were many provisions being recommended by a Select Committee appointed by the House of Commons the most important of which were:-

Permission would be for a defined area and could not exceed five years, after which period renewal would be subject to the original conditions. No licence could be granted until three months after the public announcement of the application. When the licence (full or provisional) had been issued streets could be broken up for laying the necessary wires. They also indicated that where the supply of electricity made the supply of gas cease to be remunerative that the gas company should be relieved of its duty to supply. The committee adjourned until 8 June 1882 to consider any amendments.[7]

In 1890 The Electric Lighting Company received its provisional permission and began to update the equipment in Earl Street. The series lighting dynamos were replaced by rope driven Brush (Mordey?) single phase alternating generators (Fig. 2), and transformers were placed in the customers' premises.[8]

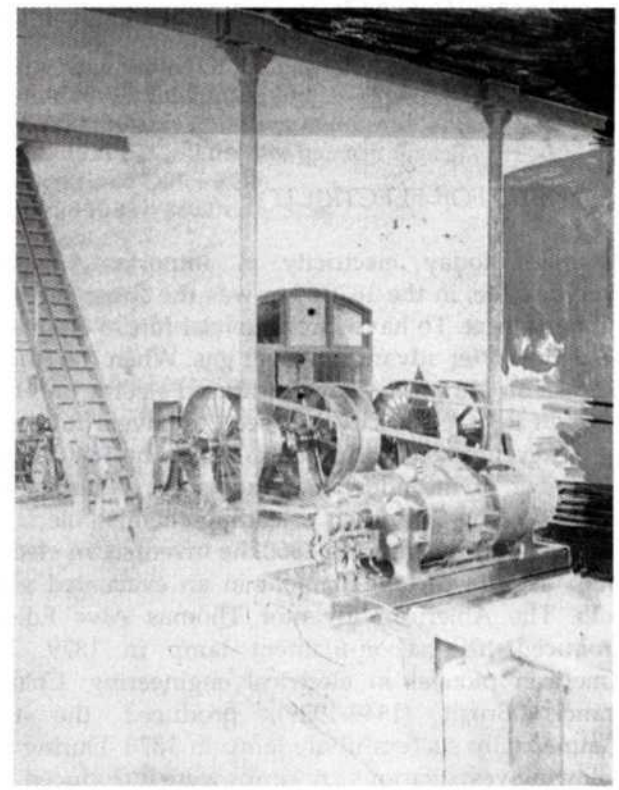

Fig. 1 Earl St. c.1882 showing Brush arc lighting dynamo (photo J.D. Blomfield & Co.; Milne Library, Amberley Museum)

THE 1895 EXTENSIONS

Major extensions were carried out in 1895 and were reported in *The Hastings and St Leonards Observer* 25 May.[9] A new stack was added standing 156 feet high which required a foundation 28 feet deep and 27 feet square. The site is on the side of a steep hill and the excavations had gone down to find rock on top of which 8 ft of concrete had been laid prior to bricking up a further 6 ft to form a 14 ft. 9 in. square. The stack had a clear opening of 9 ft. 6 in. at the base reducing to 7 ft. 6 in. at the top. Up to 40 feet it was lined with firebricks and at the base the thickness was 2 ft. 7½ in. reducing at the top to 1 ft. 1½ in. at the summit. The structure used 200,000 bricks and weighed about 855 tons or including the concrete base 1,245 tons. The flues to take smoke from the boilers to the stack were 5 ft. wide and 9 ft high and controlled by large butterfly valves. The total cost of the works was £1,700

THE HASTINGS CORPORATION TAKES OVER IN 1899

A special meeting of the Council was held on the 17 December 1897[10], convened pursuant to the Electric Lighting Act 1882. It dealt with in great depth the prospect of purchasing the Hastings and St Leonards-on-Sea Electric Lighting Co. The measures they sought not only included generation but also the rights (summarised here) to:-

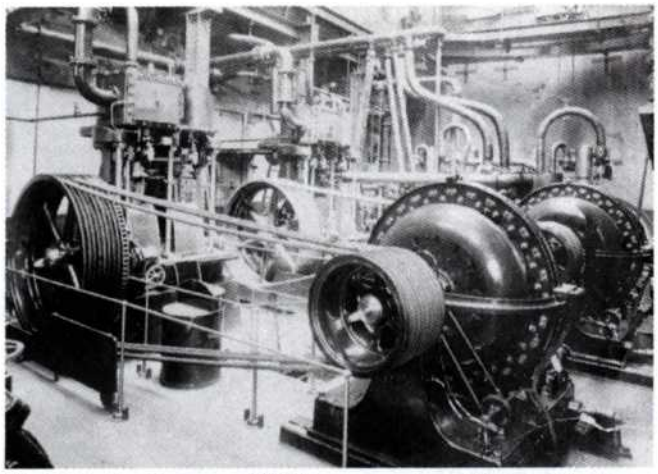

Fig. 2 Engine Room c. 1890; Brush engines driving Mordey single phase alternators.
(Photo Messrs. Blomfield & Co.; Milne Library)

> "Purchase take, lease or hold lands and use on those lands proper engines, dynamos, batteries, machinery, works, buildings and appliances.
> Break up and interfere with all streets, roads, public places, bridges, drains, telephone, electric and telegraph wires.
> To manufacture hire sell and let lamps, transformers, meters, dynamos, fittings, plant machinery and all other matters or things required for the purpose of the order.
> To enter upon any house, buildings or land to be supplied
> To charge monies borrowed on the borough rate."

Copies of this far-reaching proposal could be had from the town hall price 1/- although many would not be aware of this because the official advert was placed in *The London Gazette* 30 November 1897, I suspect not widely read in Hastings!

At the same time the lighting contract for the sea front was renewed for April to May at £4 per Lamp and for June and July at £3 per month, the charges to include trimming the carbons.

In May 1898[11] the Public Lighting Committee of the Council announced that electric light machinery had been delivered to Waterworks Road and it is now in working order. They gave one months notice to terminate the Front Line agreement. This was followed in June[12] by a request for sanction to borrow £58,000 to purchase the Hastings and St Leonard's-on-Sea Electric Lighting Co.

A valuation was requested much of which concerned the property but also included the machinery as follows:-

> 3 Babcock and Wilcox boilers of 140, 160 and 280 nominal HP respectively
> 1 Brush Engine, 50 kW Mordey Alternator and Exciter
> 3 Brush Engines, 100 kW Mordey Alternator and 2 Exciters
> 1 Spare Exciting Set
> 1 Day load 25 kW Alternator, Exciter and Engine
> 3 Feed pumps, Well pumps, Tanks, steam and water piping
> Valued at a total of £9,022

The valuation stated that 271 consumers had 280 meters and the maximum demand had been 310 kW of which 20 kW was for public lighting.

Dividends paid for the previous years were stated as

Year	%	£	s	d
1888	3	205	10	0
1889	3	205	10	0
1890 (March)	3	205	0	0
1890 (Dec 9 months)	3	256	17	6
1891	7½	517	0	0
1892	5	569	2	11
1893	5	932	2	9
1894,95,96		nil		
1897	6	1633	4	0

No explanation is offered for the years where no dividend was paid or indeed the two payments in 1890

On the winding up of the Hammond Electric Light Co. (who had provided the original equipment and retained shares in the Hastings works) the company was said to have extinguished its indebtedness to them for a cash payment of £200.

The valuer concluded that the agreement to buy for £54,200 included too much for goodwill and thought "£40,000 more nearly represents a true value."

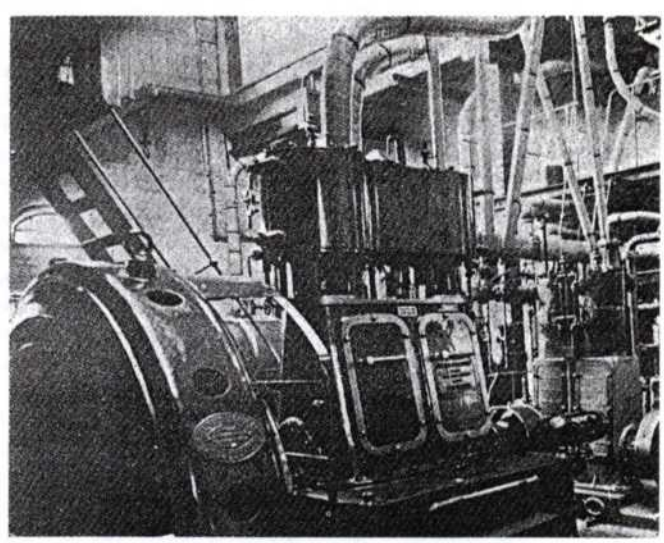

Fig. 3 Part view of engine room 1909. In the foreground: Belliss engine and alternator, carrying the day load.
The Hastings & St. Leonards Pictorial Advertiser & Visitors' List 9 Dec 1909

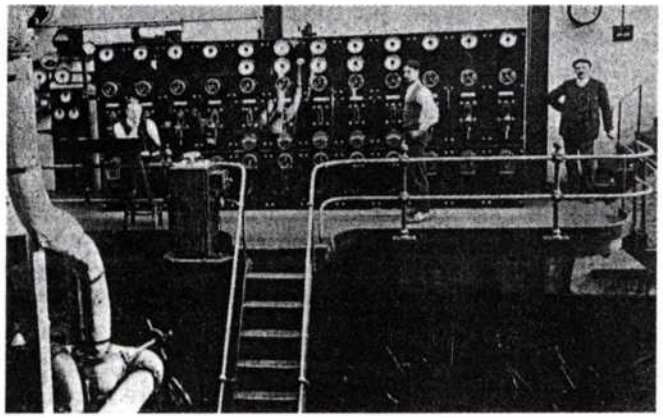

Fig. 4 The switchboard, 1909.
The Hastings & St. Leonards Pictorial Advertiser & Visitors' List
9 Dec 1909

EXTENSIONS OF ELECTRICITY WORKS IN 1922

A most detailed account was published in *The Electrical Times* of 16 November 1922 and contained the following account:-

"There has been some discussion recently as to which was the first electric supply station to start running. As "Meteor" has already mentioned – with illustration – Pearl Street, New York began operation in September 1882. Eastbourne is in its thirty-ninth year, so is Liverpool, but Hastings seems to beat all records, for it started in March 1882.

It is a remarkable station in many ways. It began as a Brush station; it will end as a Brush station. In the early days it had Brush arc lighters driven by under-type engines. Then it had Mordey alternators, which still are visible and have been doing very good service. Later on came some Parsons turbines. The station is now equipped with a new Brush Ljungström turbo-alternator of 1,125 kw [Fig. 5], which was the cause of our going down to Hastings on Wednesday of last week. The chief engineers of Brighton, Bexhill, Eastbourne, Maidstone and one or two other towns, had been invited, and, after the Mayor had heroically started up the set and been photographed in the act, we all adjourned to tea at the Castle Hotel. Here, much satisfaction was expressed over the high efficiency of the new plant. Also the Mayor and chairman told the meeting how well they were satisfied with Mr. Ferguson and all that he had done for Hastings, but they also intimated that proud as they are of the new set and the latest extensions, the days of the existing station are numbered. The Commissioners will allow no more plant to go down on the old site (Earl Street), and they are quite right. It is on a hill side high and dry [Fig. 6], no river or sea water available. and the space is so cramped that Mr. Ferguson must have had need of all his ingenuity to accommodate cooling towers, coal store, and pumps for the present capacity. The coal stores and the cooling ponds and pumps are on the roof – see photograph of the station [Fig. 7] – and the steel columns carrying them had to have very special footings quite independent of the walls, which are a mere filling-in and do not take the weight.

Well, it is obvious that a "super-station", could not be placed on such a site as this. And there is a project for

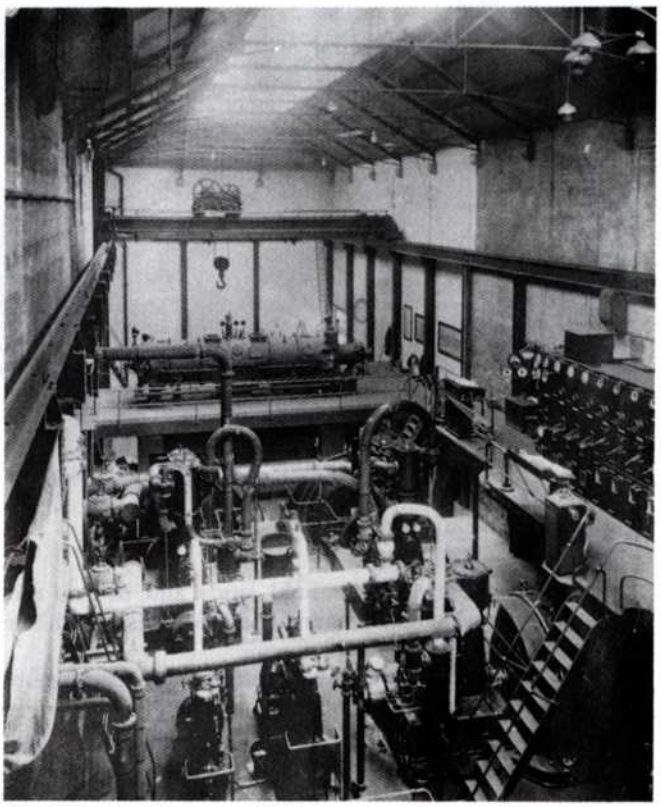

Fig. 5 Engine Room, c.1922, showing three Belliss sets in the foreground and the new Brush-Ljungström alternator across the far end.
(Milne Library, Amberley Museum)

putting down a capital station to supply Hastings, St. Leonards, Bexhill, Battle, Crowhurst, Sidley, Winchester (sic), Rye, and the tramways. The Mayor of Rye was present, and there is a rumour that the new power-house may be near Rye. But, whether that be so or not, it will have sea water for condensing.

Meanwhile, Mr. Ferguson is eager to improve his load curve. It is too peaky to please him, and he wants to obtain a lot of cooking and similar day demand. We saw sample curves, and the load peak that occurs about 6 p.m. in November is nearly three times as high as the corresponding one about 10 o'clock in June with its "Daylight Saving." There is a good winter season at Hastings. Possibly some small local industries might want power under the larger scheme projected, but it seems to us that towns such as Hastings and Bexhill will mainly look to cooking and heating for a good load factor.

Returning to the extensions opened last week, they include the Brush-Ljungström turbo-alternator [Fig. 8] and condensing plant, two Stirling boilers with Under-feed self-contained stokers, Premier cooling tower, together with the necessary new buildings, structural work, and pipe work. The turbo-alternator is rated at 1,125 kw. output with steam at 170 lb. per square inch at the turbine stop valve, 475 deg. F. total steam temperature, and exhausting into a vacuum of 28 in. (bar 30 in.). The set has an overload capacity of 25 per cent. for two hours, and runs at speed of 3,000 r.p.m. It is mounted on a Brush surface condenser, which has a cooling surface of 2,500 square feet and a capacity of 15,350 lb. of steam per hour. The auxiliaries of the condenser comprise a three-throw Brush-Edwards air-pump

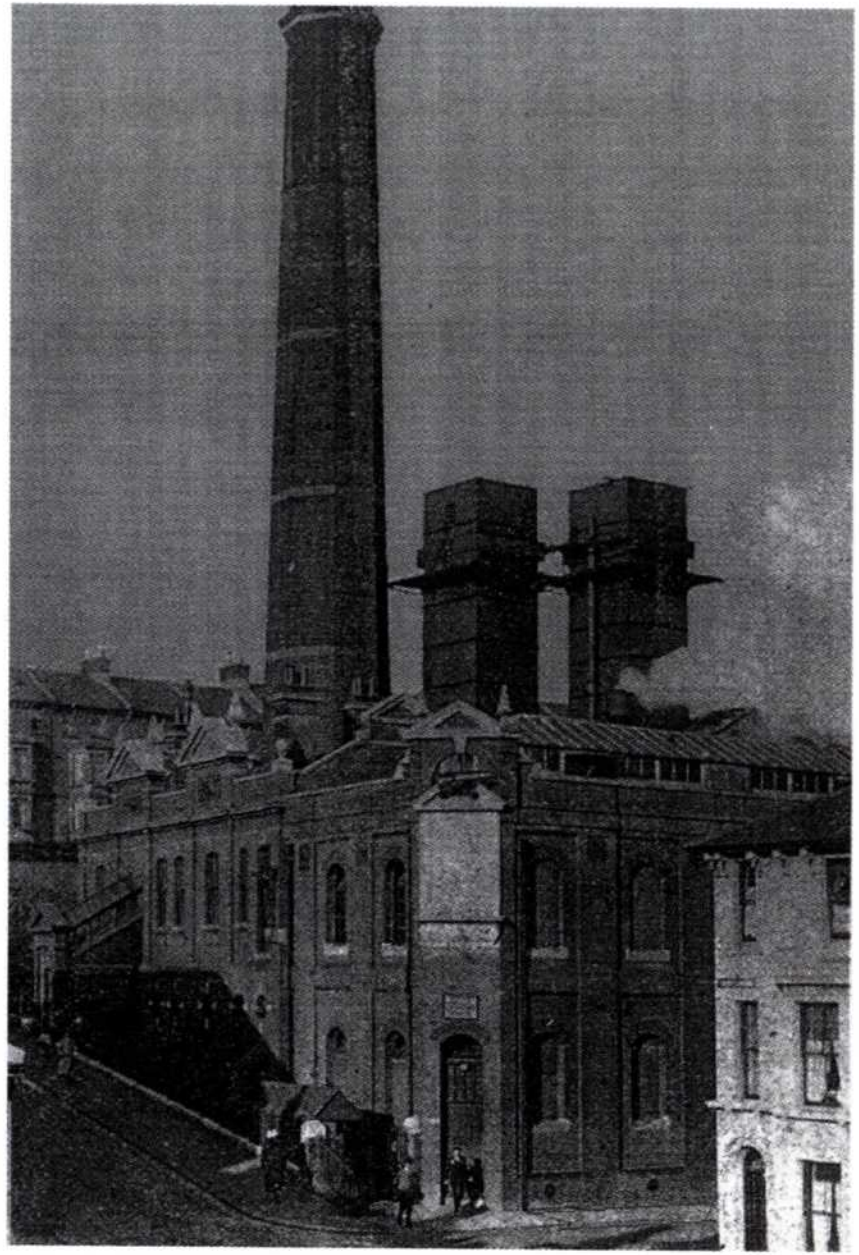

Fig. 6 Earl Street Power Station, 1922
View from Earl Street.
Electrical Times

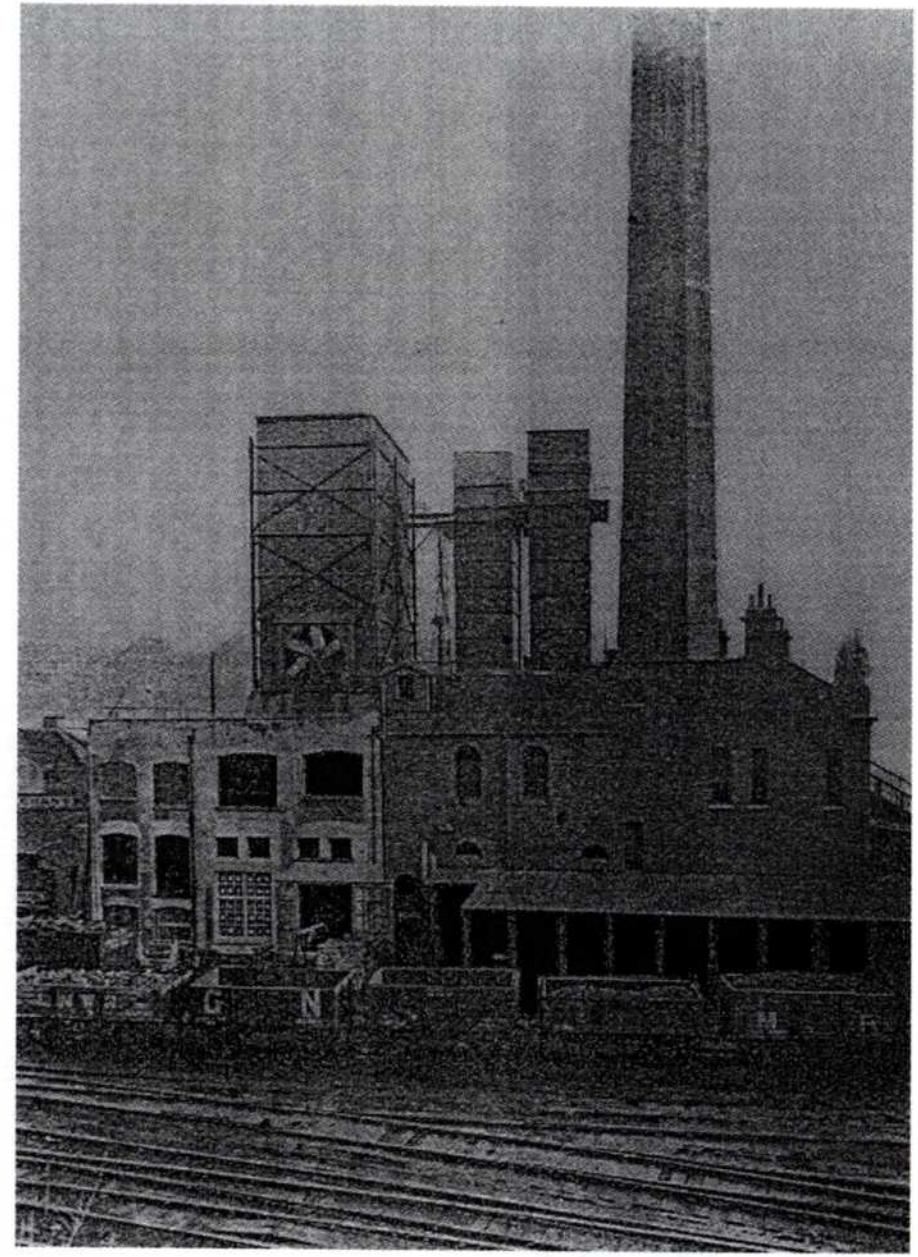

Fig. 7 Earl Street Power Station, 1922.
View from rear across railway sidings.
Coal stores, cooling water tank and pumps on roof.
Electrical Times

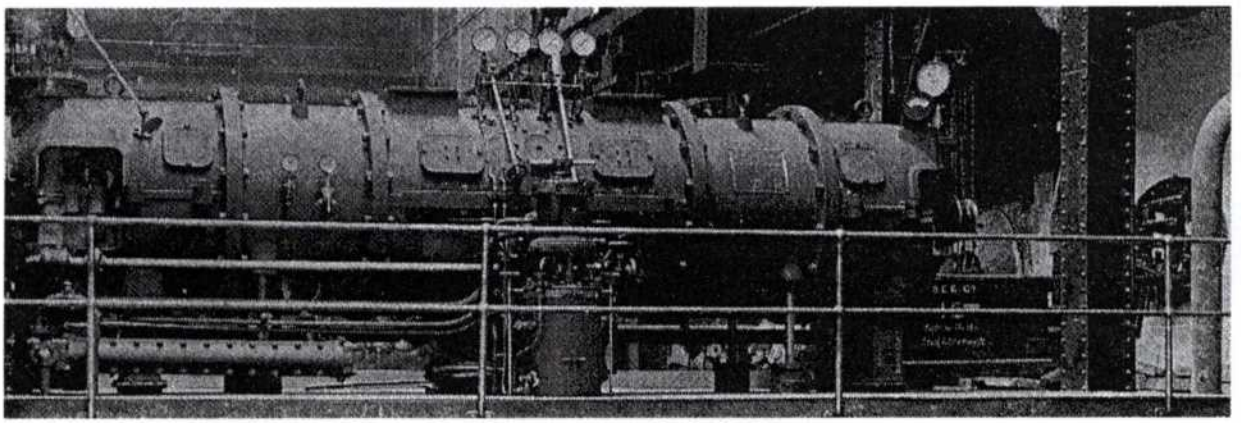

Fig. 8 Brush-Ljungström 1125kw turbo alternator, installed 1922
(The Electrical Times)

12 in. diameter by 10 in. stroke, running at 120 r.p.m. A lift-pump is driven off the air-pump crankshaft, for pumping the condensate to the hot well. The air-pump is driven by a Bumsted and Chandler 9-b.h.p. single crank, non compound double acting forced lubricated engine running at 600 r.p.m. For filtering the cooling air to the alternators, a Cleworth wheal wet air-filter is provided

The boiler plant consists of two Stirling boilers with integral super heaters and fitted with Underfeed self-contained stokers. The boilers are of the makers class "V 151/17," and are set in battery, each boiler having 255 main tubes 3¼ in. outside diameter, the heating surface being 2.644 square feet. It is interesting to note that the total linear feet of 3¼ in. tube in the boilers is considerably in excess of one mile. The total heating surface of the boilers is 5,288 square feet, and is remarkably great for the space occupied – namely height 19 ft., width 20 ft. 3 in. depth (back to front) 20 ft.

The mechanical stokers are by the Underfeed Stoker Company, They act under a combination of forced and natural draught; the grate surface of each stoker is 57 square feet, and the normal coal consumption per grate 12 cwt. per hour. The coal is stored in hoppers in front of and above the boilers; it is fed to the stoker hoppers by chutes, and is regulated by duplex coal valves. Lea coal meters are fitted to and driven by the mechanical stokers. The natural draught is provided by a brick chimney into which the Babcock and Wilcox boilers discharge, the connecting flue being underground. The boilers are fitted with the usual mountings, of Dewrance's manufacture, but in addition, Crosby automatic feed-water regulators are fitted. The steam drums, three in number, are 4 ft. in diameter, and the two mud-drums are 3 ft. in diameter.

The whole of the constructional steel work and fire-resisting flooring has been executed by the Fawcett Construction Company, Ltd. This consisted of constructing a steel frame inside the external walls of the existing building to take the load of the whole of the floors, roof, cooling tower, etc., and transmitting it on to foundations (in some cases 16 ft. deep) reinforced on the "Mon'lithcrete" system.

Great difficulty was experienced during the progress of this work owing to the fact that the walls were in a very bad condition, the bond of the brickwork being practically non-existent. This obstacle was surmounted by elaborate under-pinning and shoring, and the walls were eventually made safe by securing them to the steel structure.

The "Mon'lithcrete" floor over the new boilers is an extension of the old coal store, and has a capacity of 500 tons of coal, the mechanical stokers being fed from this floor by hoppers. The flat roof supports a 10,000-gallon Fawcett's reinforced concrete water-tank, upon which is surmounted the cooling tower.

Generally the design of the old engine-room was followed, this being particularly noticeable in the construction of the steel roof principals. The supports of the condenser consist of reinforced concrete.

All the pipe work in connection with the turbo-alternator, condensing plant, and cooling-tower has been manufactured and erected by Aiton and Co., Ltd., of Derby. The cooling tower is due to the Premier Cooler and Engineering Co. Ltd., and is of the forced draught type, specially designed to suit the restricted space available on the power station roof. The plant is capable of reducing the temperature of 130,000 gallons of water per hour from 99 deg. F. down to 80 deg. F. when the air temperature is 55 deg. F. and the humidity 75 per cent. The construction of the cooling tower proper is of first quality pitch pine and red deal, the irrigation being of a special design, offering very low resistance to the uprising air, whilst exposing a very large wetted surface.

The water is distributed by a system of open-top trough and gutters fitted with acid-resisting earthenware tubes and splash-plates, the latter quickly breaking up the water into a fine spray before it falls into the irrigation below.

The plant is erected in a Ferro concrete tank embodied in the design of the roof so as to stand all necessary loads due to wind, dead weight etc. The nominal height of the cooler is 40′ and it is provided with a gangway at the inlet discharge level communicating with the existing steel towers. This tower is designed primarily as a forced-draught plant but special provision has been made for operating on natural draught at light loads, the air in this event being induced through special doors provided at the base of the tower for the purpose. For forced draught conditions the air to the cooler is supplied by two steel plate fans 9 ft. diameter, mounted on one common shaft and driven by a high speed engine of Bumsted and Chandler's make.

The output of the station has steadily risen from half a million units per annum in 1899 to about 2 million in 1922. Some 4,000 consumers are connected, and the maximum load last recorded was 1,180 kw which by Christmas may be 1,400 kw."

TIME FOR A MOVE

The Electricity commissioners were quite right that the Earl Street station had reached its limit and that a new station was required. At first a coastal site was considered so that sea water could be used for condensing. This was rejected partly because of the risk of flooding in the areas where the railway was available. Also the beauty of the area would be spoiled bearing in mind its reliance on the holiday business. So it was that in 1925 a new station was built on the Ashford - Hastings line at Broomgrove (About two miles inland). The Brush-Ljungström 1125kw set was moved to the new building and Earl Street was retained as a stores and workshop. Today the Earl Street building is used for furniture and carpet sales but retains much of the original structure.

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1. *The Electrical Times* 16 November 1922 p445
2. *The Hastings and St Leonards News* 3 Feb 1882
3. *Ibid*
4. *Ibid* 30 June 1882
5. *The Hastings and St Leonards Advertiser* 5 Oct 1882
6. *Ibid* 19 Oct 1882
7. *Ibid* 2 June 1882
8. *Seaboard* (Magazine) February/March 1971
9. *Hastings and St Leonards Observer* 25 May 1895
10. Council Minute book Nov 1897 to Nov 1898, 17 December 1897 (Hastings History Workshop)
11. Council Minute book Nov 1897 to Nov 1898, 6 May p313 1898
12. Council Minute Book Nov 1897 to Nov 1898, 5 Aug 1898 p454

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