The LONDON MIDLAND and SCOTTISH RAILWAY

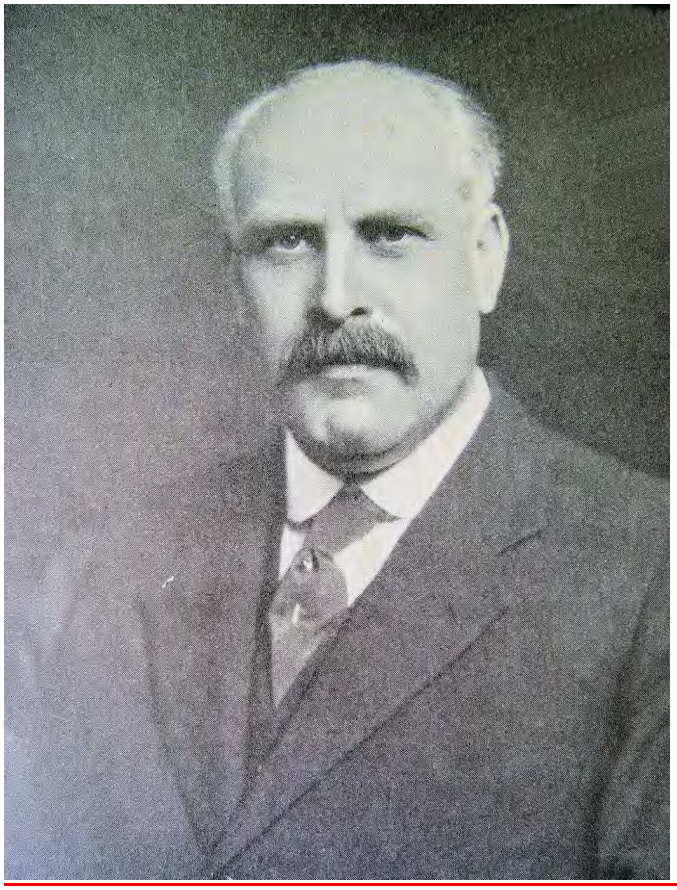
FOUNDED 1963 THE LMS SOCIETY

WORLD WAR TWO BOMBING

L. G. Warburton

LMS Society Monologue No 6

Contents



THE PRESIDENT

SIR JOSIAH STAMP, G.B.E., D.Sc. (Lond.), F.I.C.S., was appointed President of the Executive on January 1, 1926.

He entered the Civil Service in 1896 and in 1898 was appointed to the Marine Department of the Board of Trade. In 1900 he went to the Taxes Department of the Inland Revenue Department, being transferred in 1914 to the Secretariat and becoming assistant secretary to the Board in 1916.

In 1919 he resigned the Civil Service to join the Nobel Industries Limited, of which he became a director and secretary.

Sir Josiah took part in national affairs as British representative on the Dawes Committee on Reparations and a member of the Committee on Taxation and National Debt and many other public committees.

At the London University, he took the Degree of B.Sc., with First Class Honours in 1911, becoming Cobden Prizeman in 1912, D.Sc., in 1916, and Hutchinson Research Medallist in 1916. He was Newmarch Lecturer on Statistics, 1919–20, and External Examiner in Public Administration, British Constitution, &c., 1919–21. In the Royal Statistical Society, of which he is Guy medallist, he holds the offices of vice-president, hon. secretary and editor.

On Friday, October 29, 1926, Sir Josiah was further honoured at Cambridge when he received the honorary degree of D.Sc.

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The President of the LMS Railway, Sir Josiah Stamp (aged 60), was killed in an air raid on 16th April 1941 together with his wife Olive Jessie and his son Wilfred Carlisle Stamp.

Acknowledgements.

The National Archive, Kew.
LMS Board Minute.
Vic Phillips, Mike King, Tony Graham.
Reg. Instone and Mike Addison, Signalling Record Society.
LMS Operating Manager's Reports TNA Rail 418/197. 1939 to 1945.
The LMS Civil Engineer's War Report. 1939 to 1945.
The LMS Signal & Telegraph Engineer's Report to 1944.
Alan Fozard and Juan Houston for providing the Civil Engineer's War report.

Chapter 1 – Statistics.

The LMS was, at one time, the largest company in the world processing the following.
19,000 miles of track; 250,000 staff; 66 Steamers; 33 Hotels; 10,316 locos in 1923; total bogie coaches in 1933 15,877 (not including special saloons or non-passenger parcel vehicles); 305,711 goods wagons in 1923; 2376 stations in 1938 with 114 having refreshment facilities; 2904 goods stations in 1938 and 3738 private sidings; 28,000 bridges; 9370 horses and 19,432 horse wagons and carts in 1923 and there were still 6,168 horses and 18,300 carts in 1946; The LMS had two tramway systems that closed in 1926 & 27. Airways – In 1935 over 600,000 miles were flown on LMS services with 5,740 passengers carried and 17,186lbs of freight. When BEA was formed in 1948 the LMS Vice President Sir Harold Hartley was its first chairman; the LMS owned 537 miles of canal with 12,951,746 tons carried in 1938.

LMS Staff.
43,375 served in the armed forces of which 1049 were commissioned officers, 1,500 never returned and 1000 were taken prisoner.
A clerk rose to Lt. Commander, a draughtsman to Lt Colonel. 150 were decorated. 54 gallantry awards were made to LMS railwaymen.

Women

At the end of the war there were 39,000 women on the LMS whereas in 1939 there were only 25,253 over all the four British railway companies – LMS, GWR, LNER & SR.

The Blitx

The "blitz" ran between June 1940 and May 1941. From then on until the advent of the V! bombers in 1944 and later the V2 rockets there was much less enemy activity so that many evacuees went home until the V!s came over the Home Counties when there was again an evacuee panic.

The first bomb.

The first bomb to fall on a British railway was accidental by a British plane at Mells in Suffolk on 25th May 1940.
The first damage on the LMS was on the Thames Haven Branch to telegraphs etc by a bomb that fell 70 feet away on 19th June 1940.
The first bomb to fall on the LMS damaged Bristol Engine Shed Signal box at 00.51 on 24/5 June 1940, with ***o***ne line was closed for 21 hours.

V1 and V2 damage amounted to 170 times on the LMS.

Total Hits
There were 3,134 incidents on the LMS Railway, running lines were obstructed on 725 occasions and lines blocked for 143,464 hours

Killed and Injured on LMS (figures vary).
Killed – 17 passengers, 51 staff and 4 others. Injured – 138 passengers, 567 staff and 47 others.

UK Statistics
60,595 civilians were killed and over a million homes destroyed.

REC (Railway Executive Committee).
Standard net revenue £51.5m in 1913 - Government paid £43m the LMS share was £14.375,000 that should have been £19,130,000
Damage to all railways paid by the Government in 1949 to the British Transport Commission was £24.8m that was 71.5% of the correct amount.

WW1 railways were taken over under the1871 Regulation of the Forces Act

ARP
Government paid £3,250,000 for all four companies –the LMS share was £1,359,000, the LMS spent £3,740,000 plus a further £2,367,000 on maintenance and fire-watching.

Airfields.
There were 792 of which 572 were near a railway and 120 next to a railway with about 40 near the LMS.
Notable the US 8th Airforce had 1054 planes crashing other than on operational sorties. The Luftwaffe lost about 1500 planes in and around the UK...

Railway Rates Tribunal
The tribunal fixed the railway rates that were known to all including road hauliers who could then undercut the railway rates.
Also the railways were '***common carriers***' meaning that no job could be turned away, a feature that lasted until it was scrapped by Dr. Beeching.
The railways therefore had to accept the transit of such huge things as power transformers etc that would require the tracks to be slewed to avoid fixed signals etc Movements that could only be done on Sundays and night times entailing much work and extra staff.

High Ranking German Generals.
All were camped near Windermere when in October 1945 they were sent to London in first class accommodation at the request of the War Office for interrogation prior to the Nuremberg war trials.

Chapter 2– The 1940 Blitz commences.

With all preparations in place, shelters and bunkers built and camouflage completed, the London staff re-located and with pre-conceived notions built up with little or no data as to what will really happen, it was a question of wait and see. Note that the 24hour clock system is used throughout

Summary
Incidents caused by air activity were so numerous that it would require a separate volume of some magnitude to record them all, and it is only practicable to basically review them and their effect. Ironically the first bomb to fall on a British railway was dropped by an RAF plane on 20th May 1940 being on Mells station in Suffolk. The first incident on the LMS Railway due to enemy air action occurred on the Thames Haven branch at 05.00 on 19th June 1940, when a bomb fell 70' 0" from the railway fencing damaging the banking and block telegraph wires. Shortly after midnight at 00.51 on 24/25th of June 1940 the first bomb dropped on LMS property, being Bristol engine shed that damaged the permanent way and the roof of the shed. One running line was blocked but restored within 10 hours. At the same time incendiary bombs fell on the Goods Shed roof at Bristol St. Phillips burning a hole in the roof, but damage was restricted due to the efforts of the staff. A further incendiary hit a footbridge at Ketton on the Manton Peterborough line, burning a hole in the timber floor. On that same morning at 03.15, a high explosive bomb landed on the permanent way at Ullesthorpe on the Leicester - Rugby line that made an 8' 0" diameter crater 10' 0" deep causing settlement to both tracks. The first unexploded bombs also fell on or alongside the permanent way at the same place causing the up line to be blocked until 18.15 that day and the down line until 19.00 the following day before the bombs were removed by the military. Serious difficulties and delays occurred with unexploded bombs due to the lack of co-ordination between the Civil and Military Authorities. The arrangements between the railways and the Ministry of Home Security for dealing with unexploded bombs were then reviewed in the light of experience and placed on a much better footing, but further experience led to more improvements in October 1940. There were seven incidents in that last week of June 1940, the most serious was the damage caused to the canal dock wall and shed at Etruria (Stoke-on-Trent) on the Trent and Mersey Canal. Bombing was intermittent during July with ten "incidents" in England and Scotland but only one being serious. Raids were spasmodic until 24th

August 1940, after which they rapidly increased in both frequency and weight, becoming intensive during September. In August 1940, 85 places were bombed, 8 of which were in the London area. The first bomb in the London area fell at 18.50 on the 18th August on Shoeburyness Station, causing damage to the Signal Box, permanent way and footbridge. Traffic was blocked for six hours whilst the track was repaired and temporary signalling installed. The first real attack commenced on 7th September when the target was East London with 183 incidents during that month. The most destructive was at Poplar 'A' Warehouse and Shed on the 7th with extensive damage to Haydon Square Warehouse on the 9th. Away from London, the Liverpool District was the worst hit with 62 incidents that included the gutting of Alexandra Dock Warehouse on the 21st September **(Plate 1)** and Brunswick Goods Shed on the 26th September. Railway attacks intensified reaching their maximum during October and still further in November with the London area still the main target although Birmingham and Liverpool also had severe attacks that included the highly concentrated bombing of Coventry on the night of November 14th/15th. In December the main targets were the Liverpool, Manchester and Birmingham areas followed by two months in which damage was relatively light with the Swansea and Holyhead areas heading the list of incidents. The damage that affected the running lines most seriously, and proved to be the most difficult to repair, was that caused by high explosive bombs to arches and retaining walls. Unexploded bombs and parachute mines also caused serious blockages due to the danger of them exploding from vibrations if movements were made in the vicinity, not to mention the grave risk to those personnel involved in removing them. This led to an instruction from the Government in October 1940 that such bombs were not to be interfered with until 96 hours after they had fallen, unless they were causing very serious interference with important traffic, and no reasonable alternative was available. The delays caused by unexploded bombs and mines can be gauged from the fact that during November 1940, there were 30 cases of unexploded bombs and 10 of unexploded parachute mines falling on or close to LMS property and lines interfering with traffic movements. Seven of the bombs and two of the mines caused serious obstruction and were placed in Category "A", i.e., to be removed urgently with delays to the railway reduced as a result of the better contact with those responsible, coupled with the skill and resource displayed by the Bomb Disposal Squads and Admiralty personnel.

Fires due to incendiary and high explosive bombs were very numerous but, generally speaking, were attacked with considerable success by the staff, occasionally aided by the local authorities. There were however, several cases where buildings such as warehouses and stations sustained heavy damage by fire owing to water mains being damaged during a raid causing a failure of the water supply. There were a few instances, during the very heavy raids, when the local fire-fighting services were overwhelmed. At the outbreak of the war the LMS had three fully equipped fire trains with motor pumps and tanks stationed at Derby, Crewe and Horwich. In July 1940 orders were placed for 83 Ransomes and Rapiers 1½" self-priming water pumps that could be stored at selected locomotive sheds throughout the system, ready for immediate despatch by light engine with trained staff to attack fires, water being used from the tank or tender of the locomotive if necessary. Unfortunately, considerable delay took place in obtaining these pumps and the required accessories owing to the contractor's premises sustaining serious damage during the heavy raids. With deliveries only commencing in May 1941 and completed in August, meant, that by the time the pumps were ready for use in May 1941, the heavy air raids were almost over. In spite of this they did prove useful in later smaller air raids, sufficient to state that, had they been available when expected, the damage by fire would have been considerably reduced.

At the Board meeting on 26th September 1940 it was reported that since the enemy commenced large scale bombing and damage, the Company's precautionary measures had proved effective. The provision of shelter accommodation was being extended, and all signal boxes were being provided with shelters as quickly as steel supplies allowed. Arrangements were in hand for the distribution of 65,000 additional steel helmets and 50,000 civilian duty respirators. It was also pleasing that the instructions developed by the LMS for trains and vehicles contaminated by liquid blister gas had been adopted for general use by the REC.

From August 24th to November 1940 inclusive the LMS Railway was affected by air raids on 95 of the 99 days, the raids being heavy on 53 of those days. A brief review follows of the incidents that occurred in the above four areas during the 99 days. Only the more serious instances are listed, but here again a division will be made and only the major features will be mentioned in the text.

The strain on the staff and organisation of certain of the Engineering Districts was intense but there were relatively few occasions when the enemy succeeded in closing a line for more than a few days and very few in which limited operation was not resumed within a few hours. Even when unexploded bombs or extensive damage occurred to delay the restoration of traffic, there were usually alternative arrangements that solved the problem, as the incidents detailed below will show.

Thames Estuary, (East of Bromley).

There were eight heavy daylight raids on this area on 26th and 31st August and 7th and 15th September, and night raids on 15th and 27th September and 14th and 15th October 1940. The worst was on the evening of Saturday 7th September when a tremendous attack was made on the Thames Estuary and East London, including the London Docks. In several places the main lines were heavily damaged by direct hits, whilst at West Ham an empty electric train was hit and the platforms and lines were so heavily damaged that the station was closed until 11th August 1941, (11 months later) when it was opened for electric services only. Very serious interruptions to traffic working on the LT&S Section ensued, but a steam service was maintained east of Barking with occasional interruptions by unexploded bombs, whilst a shuttle service of electric trains was generally run between Upminster and Barking or East Ham. The services were gradually reinstated west of Barking during the following week as repair work was completed, but damage on the LNE line at Stepney and Fenchurch Street held up services to and from Fenchurch Street until 17th September. In the interim the steam and electric services available west of Barking were used to the best advantage, and where neither service could be run, bus services were introduced, thus giving an emergency service throughout, whilst full use was made of the line between Barking and St. Pancras to give an alternative service. Freight trains were badly affected. Subsequently the Tilbury and Southend services were frequently interrupted at various places, and on several occasions Fenchurch Street Station was isolated owing to damage on the LNER Company's lines.

Shoeburyness - 18th August.. Two high explosive (HE) bombs dropped, one close to the station signal box and the other on the nearby permanent way. The box was practically demolished and all communications completely severed. The signalman was killed, this being the first war fatality on the LMS.

Tilbury Section - 7th/ 8th September. The air raid commenced at 17.00 on the evening of the 7th, when extensive damage was caused by high explosive and incendiary bombs. Signalling suffered considerable damage at several places throughout the Tilbury Section, generally to signal box structures, electrical signalling equipment, power cables and overhead lines of communication, much of which was completely destroyed. The Skinner Street linemen's Depot was burnt out.

Plaistow – 7th September. Station Damaged. **(Plate 2).**

***Bow Junction – 14th September*. (Plate 3).**

Appreciation

The Board meeting on 26th September 1940 requested the Chairman Lord Stamp to convey to Mr Wallace (Chief Civil Engineer) and Mr Bound (Signal and Telegraph Engineer) together with their staff, the Board's appreciation of their fine work in repairing air raid damage and keeping lines open for traffic.

London Area Passenger Stations.

Finchley Road Station – 2nd October. A much longer time was required to restore traffic following a high explosive bomb that landed behind the retaining wall at the Finchley Road end of Hampstead Heath tunnel. A length of 30 yards of the wall was destroyed with three of the girders spanning the line displaced. Rebuilding the wall was essential and it was not until the 17th October that one of the two lines could be used for single line working. Normal use of both lines was not possible until early in January 1941. Clearly this stretch of the old North London Railway was not as important as the

previous example and required a bus service between Finchley Road and Hampstead Heath Stations for passengers who could not use alternative routes.

St. Quintin's Park - 2nd October. Station premises extensively damaged.

Kilburn – 8th October. At 20.30 a large calibre high explosive bomb fell on the main line at Kilburn, forming a crater 12' 0" deep and 60' 0" in diameter across all four lines. The Up fast line was lifted bodily and deposited on top of the Down fast line, the whole being covered with clay from the crater and brickwork from the foundations of an old wall. The Down Slow line was lifted several inches and the Up Slow badly distorted. A further complication was that the line became flooded from a broken sewer in Kilburn High Street. This was a serious breach of a very important line, but the Down Slows were re-opened for traffic at 12.10 the following day and the Fast Lines by 17.50.

Hampstead Heath – 10th October.. Station buildings destroyed**.**

Kensal Green, London – 12th October.. In this incident a bomb fell on the Up Electrified line tunnel at Kensall Green between Euston and Watford, destroying a part of the segmented cast iron lining and letting in debris from above. The line was blocked until 27th October. On the 7th November the adjacent Up and Down Slow line tunnels for steam traction were penetrated by a high explosive bomb and about 30' 0" of the brick lining was brought down with the resultant debris. The slow lines were blocked until 21st November.

North London Line. – 13th October. The North London line between Haggerston and the Broad Street Terminus was the subject of the most serious and protracted interference with traffic. A high Explosive bomb badly damaged Union Street Bridge north of Shoreditch blocking all four lines on a length of line that is elevated above the surrounding property and is carried over several streets. By the following afternoon one line opened for traffic but that same night a further bomb fell on Primrose Street Bridge, between Shoreditch and Broad Street blocking all lines again. This rendered serious damage as the abutments were badly affected, and, whilst work was in hand, yet another bomb fell on Laburnam Street Bridge between Haggerston and Shoreditch on 25th October, again blocking all four lines. Through Traffic between Haggerston and Broad Street was not resumed until 11th November when two lines were re-opened with the other two finally brought into use on 14th February 1942.

Whilst the LMS received its share of the bombing on London, there was not always a direct relationship between the incidents on the railway and the severity of the attack on the town. During the concentrated bombing on London on the night of 29th December 1940, when so much damage was done, there were only three incidents on the LMS showing how the great size of London was responsible for such disparities. On the other hand Coventry provided the best example of a concentrated attack on a limited target. Not only was Coventry served exclusively by the LMS, the greater part of the town lay within a triangle of lines one of which was the main line from London to Birmingham and the Black Country.

Highbury 14th – October. Station premises gutted.

LMS Director **William Lionel Hichens** was killed on this night at Church House, Westminster.

Queen's Park – 15th October. **(Plate 4)**. At 19.45 a bomb fell on the line in front of the 19.30.express from London to Inverness, hauled by Royal Scot 6122 "Royal Ulster Rifleman" that ran into the debris. The engine and several coaches overturned and the driver and firemen were injured but survived. About 40 minutes later a second bomb exploded a short way ahead blasting the retaining wall onto the electrified tracks towards Kensall Green Station. More bombs fell at 02.00 damaging Queen's Park No. 2 Box, blocking the line with more debris. One LPTB staff was injured at Queen's Park Station. The lines were re-opened in stages between 22.50 on 16th October and 09.30 on 26th October.

St. Pancras Station – 15th October. **(Plates 5 & 6).** At 19.28 the sirens sounded for what was the heaviest raid of that month in which 400 bombers took part and 430 people were killed. The attack went on until 05.10 in the morning. At 03.25 a signalman on duty outside St. Pancras Station observed a landmine attached to a parachute suspended in the signal bracket over Nos.1 and 2 platforms, whereupon he urgently called the station staff who in turn notified the Civil Defence Authorities At 03.50 the mine was pronounced live and the station evacuated, that is apart from a gang of men who had unofficially taken refuge in the basement at the terminal end of St. Pancras Station. One can only imagine their awakening when the landmine was exploded at 05.15. There were no casualties but the station was very badly damaged. A large crater was formed at the north end of Nos.1 and 2 platforms badly damaging the permanent way. Most of the glass and slates in the high arched roof were brought

down, with most of the rooms and offices in the station suffering damage. Sixty coaches and two wagons were damaged and the station lighting put out of action, as were all the telephones. With no telephones, the District Engineer's control clerk, who was on duty at St. Pancras Chambers, on his own initiative sent a runner to the Engineering Department in Kentish Town with instructions that all artisans booking on duty at 07.40 were to proceed immediately to St. Pancras Station. The permanent way Sub-Inspector, who was also on night duty at St. Pancras, also went to Kentish Town to assemble as many permanent way staff as possible. Altogether 233 men commenced work that morning in the clearing of the debris, all of whom had experience of the nightly raids for more than a month, and came from their shelters, or from civil defence duties, to help re-open St. Pancras Station. Initially it was thought the huge roof could be unsafe as the base of one of the cast iron support columns was fractured, but two scaffolders from the District Engineering staff volunteered to make a preliminary inspection of the steelwork. Following their favourable report two steeplejacks were engaged to remove broken glass, ironwork and glazing bars. The first objective was to clear an accumulation of parcels by concentrating on the re-opening platforms 1 and 2 that was achieved, with the lines restored by 17.00 in the afternoon. The roof being devoid of any covering it was impossible to blackout the station, with work only proceeding in daylight hours. With the exception of the parcels traffic the station was closed for five days, mainly due to the need to remove all the loose glass from the overall roof. In this period 100 wagons of debris were dispatched. During the stoppage, trains were dealt with at Kentish Town, but a limited service into St. Pancras was restored on 21st October, extended on 23rd, with a full service resumed on the 16th November 1940. Of interest was, that free cups of tea were provided for the workers, but when traffic was partially restored almost everyone on the station, including troops and passengers also lined up hoping for the best. The St. Pancras Junction and Station boxes were damaged, the relay apparatus and battery huts, with all their contents such as rectifiers and transformers were destroyed. The Lineman's Depot with almost all contents was also destroyed, as well as a bracket signal. ***7th November*** – three high explosive bombs fell on the station, one on No.1 platform damaging the roof and the booking office, and one on the main road in front of the station. Nos. 1, 2 and 3 platforms were out of use until 11th October.

Gospel Oak – 16th October. Station buildings extensively damaged.

Euston – 19th October. Incendiary bombs set fire to the roof of the Great Hall and high explosive bombs made a crater in the roadway between Nos.2 and 3 platforms, damaging the station roof and offices in Drummond Street, and the west wing of the Euston Hotel. Platforms 1 to 6 were blocked, No 6 being opened on 21st, Nos.4 and 5 on 24th, with the remaining platforms in the evening of the 27th.

Kensington (Addison Road) – 20th October. Station building extensively damaged.

Queen's Park Station – 5th November. The retaining wall and station was damaged. **(Plates 7 & 8).**

West End Lane – 16th November. Station buildings and platforms badly damaged.

London – 29th December. – The heavy raid on this date was later described as the "London Fire Blitz" as most of the LMS damage was due to fire, with the line blocked at one point only. Fires were started in several buildings, but prompt and efficient action by staff prevented all except one causing extensive damage at Whitecross Street Goods Depot, where a stable with 99 stalls was almost completely burnt out. The staff evacuated the horses safely.

Goods Stations etc.

Poplar "A" – 7th September High explosive bombs destroyed old and new warehouse and a considerable number of wagons, whilst the east quay 30 ton crane and two coal tippers were heavily damaged, six other cranes being less severely damaged.

Canning Town- 7th September. Shed demolished and office badly damaged.

Haydon Square – 10th September. Heavily damaged by high explosive and incendiary bombs. Grain warehouse and dry bond gutted, banks and shed on High Level and small warehouse destroyed. Horse cartage vehicles and equipment badly damaged

Poplar "B" – 17th September. Warehouse destroyed and other buildings heavily damaged.

Somers Town – 18th September. High explosive bomb fell in Euston road, knocking down the front wall and causing damage to shed roof and offices.

Camden – 22nd September. Princes Road stables badly damaged and damage to new warehouse and on ***26th September,*** four large craters caused in yard, clerks' canteen demolished and electric cables damaged.
Kilburn and Brondisbury – 16th September **(Plates 8 & 9).** Extensive damage to the viaduct
St. Pancras – 24th September. Damaged by high explosive and incendiary bombs including damage to hydraulic workshops, water main, glass roofs and ambulance room.
Stonebridge Park Car Sheds – 2nd October. Extensively damaged. **(Plates 10 to 12)**
Commercial Road – 1st November. Buildings and offices considerably damaged.

Appendix 'A' (page 51) details the lines blocked and the duration for the months September to November 1940 in the London area.

Birmingham, Coventry and Wolverhampton Areas.

The first raids in this area were on two consecutive nights of 25th and 26th August 1940, and were fairly heavy. The area was then free from raids until the night of 12th October, followed by further heavy raids on the nights between 11th and 31st October and on 14th, 19th and 22nd November. The concentrated raid on Coventry on 14th November led to coining of the word "Coventrated" in connection with air raids. As the particulars in **Appendix B** show, the line blockages caused were numerous, and important sections of the main lines and stations, including New Street, Birmingham, and Coventry, were isolated on several occasions, whilst extensive damage was done to buildings, warehouses and stations, and to the District Control Offices at New Street. Signal boxes and signalling equipment with cable routes and overhead telegraph wires received considerable damage causing signalling operations and telegraphic and telephonic communications to be put out of use.
Special mention is made of the following raids that had a serious effect on traffic movements.

16th October 1940. Birmingham (New Street).

New Street No.5 signal box was practically destroyed by a direct hit by an HE bomb about 8pm that blocked the up and down Wolverhampton and up and down Gloucester lines for 36 hours each. The signal box was 76'3" long by 12'0" wide by 8'0" elevation, with a cellar 7'3" below rail level to accommodate the locking. It was fitted with a 153 lever Webb tumbler frame, the cellar and lower storey constructed of brickwork with a wooden superstructure from the working floor level. Virtually the whole of the brickwork of the lower storey was demolished, the blast destroying about forty levers, instrument shelf, block instruments, telephones, batteries, relays etc, and damaging the wood portion beyond repair. The following morning arrangements were made for complete possession of the running lines and debris amounting to forty wagon loads were cleared away, coincident with this an adjacent signal linesman's room was fitted up as a temporary block post by the provision of the required block instruments and field telephones. It was decided to demolish the remaining portion of the brick lower storey and to use two of the ARP 43' 3" emergency signal boxes, one being obtained from St. Helens and the other from Stafford Stores. On 17th these were loaded up and arrived, one on the same day and the other by special train early next morning. The variation in the overall length necessitated altering the corner and intermediate posts to suit, also the flooring to suit the Webb frame to which forty new levers were added, the whole frame being re-locked. The Crewe construction gang commenced on the rebuilding of the cellar portion of the old box to form the foundation for the new all timber structure and the general work of construction continued from daylight to dark each day. On the 20th a start was made on erecting the first half of the wood superstructure which had meanwhile been altered in height and also made suitable to join up with the second half. The first half, including the floor, was finished and the roof sheeted over as a temporary measure on the 22nd. The remaining half was erected in 10' 0" sections each day, commencing the next morning, to suit the progress with the brickwork of the cellar. The final stage was erected on 26th, the floor completed and the roof sheeted over the following day, when all the window sashes were fixed and gas lighting installed. The points were then coupled up to the levers which remained without interlocking, the block instruments and telephones installed, and the signalman returned to the box at 6pm on the 27th, eleven days after the mishap. Complete restoration of all interlocking was effected at 1pm on November 7th, but the roof was not finished and slated until the 19th November.(**Plate 13).** During the period of disconnection, traffic operations were carried on by ground staff who operated the points and flagged trains under the instructions of the signalman in the temporary block post. Communications suffered

severely, the District Control Office and Telegraph Office being completely destroyed, necessitating operating from the Shelter Control Office. Ultimately, as previously stated, new offices were provided. At Birmingham Lawley Street, prompt action by the S&T Engineer's staff enabled the automatic switchboard and associated equipment to be protected from extensive damage by fire and water, and the apparatus was ultimately overhauled and reinstated. All line cables leading into New Street Station and Lawley Street were also destroyed, involving extensive renewals. The up and down Wolverhampton and up and down Gloucester lines were blocked for 36 hours each. On ***24th October*** the station was completely closed for 5 hours and 20 minutes following serious damage by high explosive bombs. On ***28th October*** – **(Plate 14) s**erious damage by bombs, particularly the District Control Office, the District Passenger Manager's Office, and the Parcels Office. On ***19th November*** there was further serious damage to the station, whilst line blockages at the station and the adjoining areas completely isolated the station for 18½ hours, until 16.00 the following day. On ***22nd November*** further slight damage was caused to the station, but line blockage in the adjoining areas completely isolated the station until 12.15 on the 23rd (14½ hours), when the lines were available for Western Division trains only. The Midland Division trains could not use the station until 17.00 (10 hours).

Saltley – 17th October. The Mill Road Bridge carrying four lines of railway over the roadway was badly damaged by a high explosive bomb, and only the down line to Camp Hill was safe for traffic. Single line working was put into operation over this line until the up main line was available at 17.00, 4 days and 17½ hours later, on the 22nd. The down line was not opened until the following day, and the up Camp Hill line until the 27th October.

Vauxhall and Duddeston – 1st November. Station Damaged. **(Plate 15).**

Spon Lane – 14th November.

The raids on Birmingham were not sustained for so long as in London, nor so concentrated as in Liverpool but damage in and around Birmingham was heavy. There was though, an ideal example of a single bomb dropped in the right place. At Spon Lane, between Birmingham and Wolverhampton, the railway consisted of two tracks supported by a retaining wall 27' 0" high adjoining the Birmingham Canal. On the night of 14th November 1940 a high explosive bomb fell on the edge of the towpath and seemingly lifted the wall and dropped it again. For 150 feet of its length it was bulged about 6inches and badly cracked, and the movement of the wall caused subsidence to the rail track. A trench was sunk at the back of the wall in order to ascertain its condition, when it was found necessary to strengthen it and carry the rails on girders to transmit the weight of the trains directly on to the foundations. The repair work was carried out under very difficult conditions, and it was not until 14th January that the Down Line was re-opened for single line traffic with the Up Line being out of use for ordinary traffic until 29th July 1941, eight months after the raid.

Perry Barr. - 11th December,

A land mine was dropped on the embankment about 30 yards from the North Junction signal box destroying the lower brickwork and badly damaging the upper wood structure. Considerable damage was done to the lever frame and apparatus, also the block instruments and telephones. The work of erecting a temporary block post was immediately taken in hand and brought into use on the afternoon of the 12th December.

In addition to damage to other passenger stations, the large goods stations and offices in Birmingham suffered heavily in these raids – the principal ones being:-

Birmingham, Curzon Street – 15th October. Destruction of the warehouse in the Top Yard detrimentally affected cartage working by blocking an extensive dray parking area.

Birmingham, Lawley Street – The destruction of, or serious damage to several sheds, and total destruction of the general offices.

Birmingham Central - 26th October – The Working Shed with warehouse above was completely destroyed and it was not until 21st September 1942 that it was possible to restore goods shed facilities of a temporary character at this place. **(Plate 16 & 17).**

Coventry 14th/15th November. . This area was very severely attacked, and by 23.00 the station had been seriously damaged and was isolated by several line blockages at the station and in the adjoining areas. Perishable traffic commenced to work into the goods yard from the south end only during the morning of 16th November and freight trains commenced to pass through the station during the

evening of that day, but the passenger station was not opened and the lines used for passenger trains until the morning of 17th, i.e., 2½ days after the raid.

This was the first raid of its kind during the war, when, within hours, 122 incidents occurred on the railway that was nearly twice the number on any other LMS town on any night.

The railway lines through Coventry are:-

1. The main line from Rugby to Birmingham passing through Coventry Station.
2. The connecting line from Coventry to Nuneaton that branched off from the Rugby and Birmingham line on the Birmingham side of Coventry Station.
3. The "Avoiding" line, branching off from the Rugby and Birmingham line south of the station and connecting with the Coventry- Nuneaton Line near Foleshill.
4. The branch line to Kenilworth and Leamington, connecting up with the Rugby to Birmingham line south of Coventry Station.

Bombs were dropped on all these lines, the most intensive being on the "Avoiding" line, about 3½ miles in length. An estimated 40 high explosive bombs fell on this line, which included one delayed action bomb. Craters up to 60' 0" in diameter were created with the track damaged in many places, though not seriously. A small calibre bomb fell on to a reinforced concrete bridge, damaging the arch and parapets. Special gangs of men were dispatched from Rugby and Nuneaton and the line was re-opened for traffic a week later on 21st November.

On the main line, several bombs fell on the station and the Rugby side thereof. **(Plate 18)** The roof covering the station was damaged on both sides of the line with most glass broken. The junction with the Leamington line was seriously damaged together with a mail train standing on the branch. A further high explosive bomb landed on a freight train about two miles from the station, derailing wagons and blocking the line, traffic being diverted via Leamington. A land mine fell on the goods yard near the station and there were two unexploded bombs in the cart-ways. The down platform opened two days later with up and down trains using that platform, with normal working on the main line resuming on the 19th, just four days following the raid.

It was estimated that fifteen high explosive bombs fell on the Coventry and Nuneaton line in the vicinity of Coventry causing craters in the track and damage to the permanent way. One bomb fell on a viaduct carrying the line, partially destroying two arches, putting both lines out of action. The up line was restored on the 28th and the down line on the 30th. The story could have been different had there been a vulnerable and important railway structure within the area, but the fact was, that in the most concentrated attack experienced by the LMS, the main line was back in traffic within four days and on all lines within two weeks. The S&T equipment suffered badly. A large number of signal boxes were structurally damaged together with the signalling connections and apparatus but fortunately in no case was there a "knock-out" of a signal Box as an operating unit. Considerable lengths of overhead pole routes were brought down and cable work destroyed causing serious interference with communications.

Appendix 'B' (page 54) details the lines blocked, and the duration, for the months August to November 1940 in the Birmingham area.

Sheffield - 12th and 15th December 1940 - Sheffield had its first heavy raids and on the evening of the 12th the station was hit by several high explosive bombs and buildings, platforms and roofs were badly damaged. Lines were blocked and damage was caused to passenger and goods stations. South No.1 Signal box was demolished by blast and subsequent fire along with the interlocking frame of 68 levers, and apparatus, comprising the whole of the block instruments, repeaters, indicators and telephones. South No.2 box had all windows and the roof and timber sheeting blown out, and the whole of the switchboard cabling to the two position manual switchboard at Sheffield Station Telegraph Office had to be renewed on site, service being maintained whilst the wiring was dealt with. **(Plates 19– 22).** An unexploded parachute mine also landed on the passenger station, causing the services to be suspended for passenger trains for 40 hours.

Liverpool and Birkenhead Areas.

There were seven fairly heavy raids in this area during September, viz., on the 4th, 6th, 18th, 26th and 29th, and one on 11th October and another on 28th November. The damage and line blockages were

severe and the reaction on traffic operations considerable. These featured outstanding damage and destruction by bombs and fire to goods sheds and warehouses in the dock area. There was also serious damage to railway communications, particularly at Exchange Station. The LMS suffered extensive damage during the three consecutive night raids from 20th to 22nd December when much damage was done to signalling. A number of signal boxes were damaged, two beyond repair, along with the apparatus and connections therein. Signals, outside connections, overhead wires and cables were all affected. The Signal Stores at Bank Hall received damage to the roof and the telephone exchange and telephones in the Canada Dock Warehouse, which burnt out, were completely destroyed.

13th October 1940, Birkenhead, Green Lane Junction. Four bombs were dropped (one delayed action) around the junction box that was wrecked. All block telegraph and telephone communications were severed and there was extensive damage to the permanent way blocking all running lines. By 16.30 the up fast line was re-opened for single line working and during the day communications were temporarily restored.

Liverpool - 20th December. A very heavy raid on Liverpool caused damage to Lime Street and Exchange Stations, and at Canada Dock Goods Station **(Plates 23 to 25).** The latter was flooded to a considerable depth owing to the bursting of the banks of the Liverpool and Leeds canal. The most serious result of this raid was the damage to three 30foot arch spans and two pier walls of the Sandhills viaduct **(Plates 26 & 27),** about a mile from Exchange station**,** with the result that all lines were blocked between Sandhills and Exchange Station as well as into Great Howard Street Goods Station. Temporary bridges were erected and traffic over the slow lines was resumed into Great Howard Street Goods Yard on 3rd March 1941 and into Exchange Station on 23rd March, the fast lines remaining blocked. Electric services were resumed at Exchange Station on 24th March, when the up and down slow lines were opened, but the fast lines remained blocked until 22nd March 1942. These blockages also isolated Great Howard Street Goods Station. Further damage was sustained to the arches on 3rd May1941.

Liverpool and Birkenhead 21st December. – There was a further heavy raid on Liverpool and on this night Birkenhead also suffered. Lines were blocked at 14 points and damage occurred at 17 places, including signal boxes at Wallasey, Waterloo Dock, Wapping Ford and Liverpool Exchange where Exchange Junction Box was destroyed and "B" Box damaged. In some instances the damage was serious, notably at Canada Dock where the warehouse and goods offices were gutted and records destroyed, whilst damage was caused to cranes, wagons and yard equipment. At Park Lane Goods Station the station entrance and stock warehouse were heavily damaged and the hydraulic plant put out of action.

Liverpool – 22nd December. – For the third successive night, a heavy raid affected the LMS badly. The only running lines affected were the up and down goods lines at Kirkby that were blocked for 14 hours, but much damage was caused at goods stations. At North Mersey the warehouse and other buildings were destroyed and the roofs of the loading quays and 130 wagons damaged (80 of them severely), whilst at Great Howard Street, high explosive bombs caused damage to the boundary wall and to the permanent way and 80 wagons.

Manchester Area - Christmas Week 1940.

The city had its first raid on 22nd December, and the damage and line blockage was considerable. Manchester did not suffer from too many raids, but the two main attacks were extremely severe. In two nights of Christmas week there were 89 incidents on the railway, 69 of which were on the night of 22nd/23rd December 1940 when Victoria and Exchange Stations suffered severe damage (**Plates 28 to 32**) the most serious being to Manchester Exchange Passenger Station, which was extensively damaged by fire and all lines through the station were blocked. The buildings and offices, including those of the District Engineer, were burned out and a portion of the main roof collapsed. The debris from Exchange Station was cleared, with the dangerous structural damage made safe for through traffic by 1st January 1941 with one Up and one Down platform through the station available. All platforms re-opened for limited use by the 8th January with full use of all platforms on 12th February but traffic did not get back to normal until 19th May 1941.

At Victoria **(Plate 68)** the blocked lines were cleared for traffic at intervals until 20th January except for platforms 16 and 17 that were retained for Engineer's use in connection with the ongoing repair work. Serious damage was caused at Ancoats Goods Station to the main goods shed and warehouse,

the latter being totally destroyed and falling on the working shed accommodation beneath. At Mayfield, the passenger station was considerably damaged by incendiary and high explosive bombs and was closed until 3rd January, when a limited service of trains commenced, but normal working was not resumed until 9th January 1941.

At Manchester, London Road Goods Station, the stables were damaged and two horses killed, and Ordsall Lane No. 4 signal box was destroyed by fire and some damage was caused by fire to the roof of Hunt's Bank Offices. The majority of the telephone circuits at the Divisional Control Office at Victoria Station were out of use. At Oldham Road Goods Station **(Plate 33) t**he provision shed and warehouse were destroyed and the sundries shed damaged. At Salford Goods Station the New Bailey Street Goods Shed with warehouse above was destroyed by fire, 40 wagons were badly damaged and a considerable amount of cartage equipment was destroyed. The 23rd December saw the second heavy raid when damage occurred at 16 places, with line blockages at seven, the most serious being in the vicinity of Victoria Passenger Station. At 23.45 there was a violent explosion, apparently from a number of high explosive bombs in the vicinity of the Square alongside No.16 platform, and all the buildings on Nos. 14, 15, 16 and 17 platforms were either destroyed or extensively damaged, whilst considerable difficulty was experienced in attacking fires owing to the mains water supply failing. The damage included the total destruction of the Divisional Control Centre and many of the Divisional Superintendent's Offices whilst the Emergency Control Office, which had been provided for such happenings, was flooded and the control telephone communications put out of action necessitating a hurriedly improvised control office being provided in the cellars under Hunt's Bank Offices. Nos. 12 and 13 platforms and some buildings on them were also damaged at the west end, and most of the windows in the Hunt's Bank Offices were broken by the blast. Some damage was also caused to locomotives, coaching stock and station equipment. The Parcels Office, which was the Central Parcels Depot for the city was one of the buildings very seriously damaged and the parcels and associated traffic was disorganised in consequence. The main lines through the station were closed until 11.00 the following day, when two were available for a limited service of freight trains. Passenger trains could not arrive from the west, but a few were able to leave from No.11 platform that was the only one of the six main line platforms that could be used. On 30th December Nos. 12 and 13 platforms were opened, the latter for 100yds of its length only, and a limited service of passenger trains to and from the west was commenced and improved on 18th January 1941 when No.14 platform was opened, followed by a further improvement on 27th January, when No.11 platform was opened. Up to this time there had also been many restrictions on the main line services to and from the east. On April 12th 1941 the last of the main line platforms (No.16) was opened, but as two of the platforms were not available for their full length, restrictions were placed on the length and loading of passenger trains and the conveyance of parcels traffic until 19th May. Damage was also caused to the buildings, cranes, etc. in Heaton Norris Goods yard, whilst the District Control Office at that place sustained damage and had to be vacated for a time. The extensive damage to the passenger and goods stations and the line blockages in this densely populated industrial and commercial area played havoc with the extremely heavy passenger traffic (the following day being Christmas Eve), and the freight and coal traffic. The necessity for handling the passenger traffic and much of the freight traffic at outlying stations two to four miles away, the blocking back of large portion of the freight traffic and practically the whole of the coal traffic, coupled with the diversions of heavy through traffic (east and west, and north and south) normally passing over these main lines, reacted very seriously over an area of 30 miles radius in Lancashire, Yorkshire and Derbyshire. Exchange Passenger Station and five of the six main line platforms at Victoria were out of use. All the four main lines serving Exchange Station on the west side, the four main lines serving Victoria Station on the west side, and the four main lines serving the main line platforms at Victoria Station and also Exchange Station on the east side, were blocked. Although the bay platforms at Victoria Station were not damaged, they could not be used to any extent for the main line trains serving Victoria and Exchange Stations on the east side as they were used daily for 365 trains serving the branch lines east of Victoria. A bomb also penetrated the superstructure of Greengate Street Bridge at the Salford end of the station that exploded and killed several people who were sheltering beneath. At Victoria the roofs over platforms 12 to 17 were destroyed and the underground control shelter on platform 17 was hit and damaged with several offices gutted. The permanent way within the station was distorted with water tanks and mains fractured. The viaduct between Exchange and Ordsall Lane **(Plates 34 – 37)** was also badly damaged. The slow lines were

re-opened for traffic on the 27th December but the fast lines did not re-open until 22nd March 1942. It can be seen that the most serious difficulties in traffic working were overcome within a month of the raids.

The signal and telegraph equipment received considerable damage. A number of signal boxes were damaged chiefly through broken windows. In two cases only was damage severe, the Salford Incline Box being completely demolished and Ordsall Lane No.4 having the upper portion destroyed by fire. Damage was done to signalling plant, but it was more serious to S&T equipment in connection with communications apparatus and wires. At Manchester Exchange Station serious effect upon all communications was caused by the destruction of the whole of the cables and wires attached to the wall of the station buildings that were completely burnt out. On the 23rd December Victoria Station received the brunt of the attack and buildings, including the Divisional Control Office, were destroyed, the whole of the telephonic and telegraphic apparatus, including loud-speaker equipment, being destroyed. This was a major disaster and although the personnel were safe in the shelter, the structure was shaken and serious flooding resulted. All line cables and terminations were destroyed by fire, but skeleton contact with outside Control Offices was quickly given, and all Control circuits were restored using temporary cables within a few days. Improvisation of the temporary Control Office, restoration of equipment and cables to enable the shelter to be re-occupied and finally provision of a new Control Office with the Shelter as standby, involved a large amount of work at a critical period. Destruction of Manchester Exchange Station and the heavy damage in the area resulted in the destruction of many miles of multi-core cable and open line wire, and the restoration work was made more difficult by the simultaneous destruction of all the Emergency cable Stocks in the Manchester Area.

Signal Boxes destroyed by enemy action in 1940.
Shoeburyness – 18/8/1940; Green Lane Junction – 13/10/1940; New Street No.5 - 16/10/1940; Salford Incline and Ordsall Lane No.4 – both 22/3rd/12/1940; Perry Barr North Junction – 11/12/1940; Liverpool Exchange Junction and Park lane (Goods) – 21/12/1940.

The following table covers the period of heavy air raids from 24th August 1940 until December 31st 1940 and shows the number of days in each month that the LMS Railway was affected by raids, and the number of days when the air raids were heavy. Note that when an air raid occurred at night on say the 1st/2nd October, the particulars below count as having occurred on the 1st October only, in other words a raid commencing on an evening and not finishing until the morning of the following day counts as one day..

Month 1940	Number of days in month	Number of days LMS affected	Number of days when raids were heavy.
August (from. 24th)	8	8	5
September	30	30	16
October	31	31	24
November	30	26	8
December	31	15	11
Totals	**130**	**110**	**64**

During the period from August to November 1940 there were 914 cases of damage of which 612 occurred in four areas as follows.

Area	Number of instances of damage	Percentage to line total
London	328	36
Thames Estuary	54	6
Birmingham and Coventry	157	17
Liverpool	73	8
Total for four areas	**612**	**67**

As shown above, 612 or 67% of the total number of 914 instances of damage on the LMS Railway due to enemy action in the four months under review concerned the four areas just reviewed. The remaining 302 or 33% were confined almost entirely to England and Wales with only ten in Scotland and none were serious. The remaining incidents in England and Wales were widespread and the trunk lines were frequently, and sometimes seriously affected. The only serious instances of damage to buildings during this period occurred at Salford Goods Station on 3rd October, when the Stone Jug Warehouse was gutted, and at Bristol where St. Phillips Passenger and Goods Stations were damaged by fire, including the destruction of the goods shed and three of the goods offices on 14th November, whilst on the same day the District Goods and Passenger Manager's Offices were also destroyed.
These are the bare facts as far as the main line blockages and damage to buildings at passenger and goods stations are concerned, but there were other occurrences that re-acted severely on traffic workings. It will be appreciated the locomotive sheds, marshalling yards and carriage sidings were often provided on the outskirts of all important centres, and whilst locomotive sheds fortunately escaped serious injury, there were numerous instances where sidings, which offered larger targets than the main lines, sustained heavy damage.

Plate 1.
Liverpool – Alexandra Dock destroyed by enemy action on 21st September 1940.
British Rail

Plate 2.
Damage to Plaistow Station on 7th September 1940.
British Rail

Plate3. Bow Junction following a raid on 14th September 1940. British Rail

Plate 4. Royal Scot 6122 "Royal Ulster Rifleman" seen here after running into the debris caused by a bomb at Queen's Park, London. The train was the 19.30 express from Euston to Inverness. British Rail

Plate 5.
St. Pancras – 16th October 1940.
British Rail

Plate 6.
St. Pancras 16th October 1940.
British Rail

Plate 7.
London, Queen's Park Station showing the retaining wall damaged on 6th November. 1940.
British Rail

Plate 8.
The retaining wall at Queen's Park Station having been reconstructed.

British Rail

Plates 8 and 9 show the damage done at Kilburn and Brondisbury on the night of 16th September 1940 and the temporary repairs to shore up the viaduct to get trains running again.

British Rail

Plates 10, & 11 Illustrate the damage done on 2nd October to the Stonebridge Park car sheds that served the Euston-Watford electric service.

British Rail

Plate 12.
The Stonebridge car sheds following removal of the debris.

British Rail

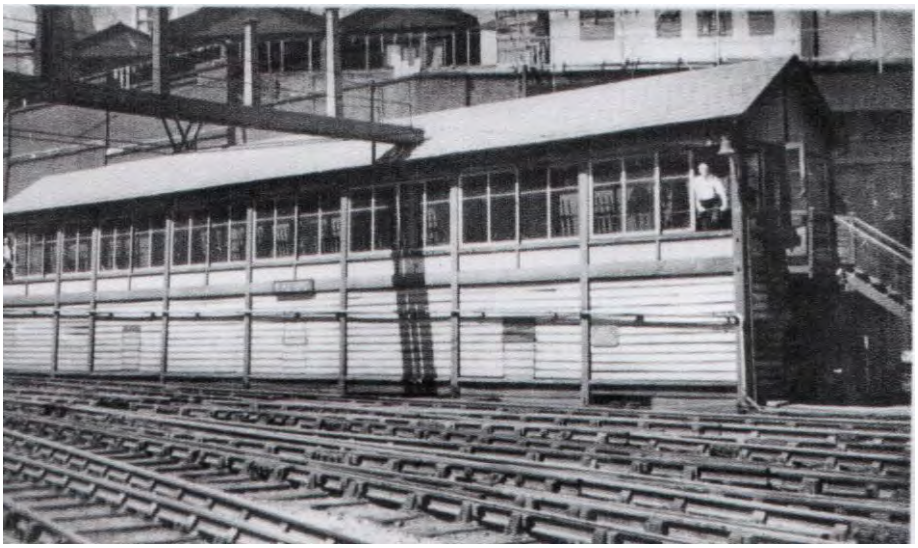


Plate 13. New Street No.5 Signal Box following re-construction in November 1940. Vic. Phillips.

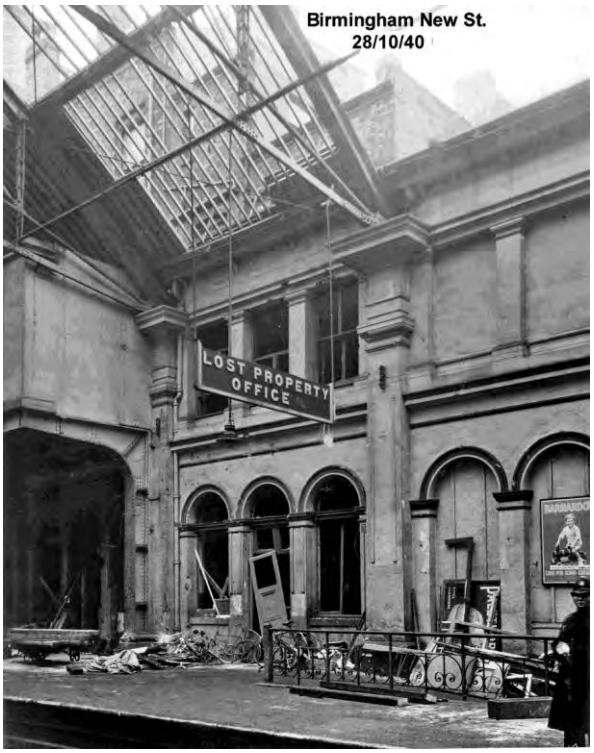


Plate 14.
Birmingham, New Street Station following attack on 28th October 1940.

British Rail

Plate 15
Vauxhall and Duddeston Station following an attack on Birmingham on 1st November 1940.

British Rail

Plate 16. Birmingham Central Goods Warehouse gutted by enemy action 26th October 1940.

British Rail

Plate 17.

Birmingham Central Goods Station was hit on 26th October 1940.

British Rail

Plate 18. Coventry Station – 15th November 1940. The picture is taken from the south end of the up platform, looking towards Birmingham, the branch from Leamington comes in on the left of the picture

British Rail

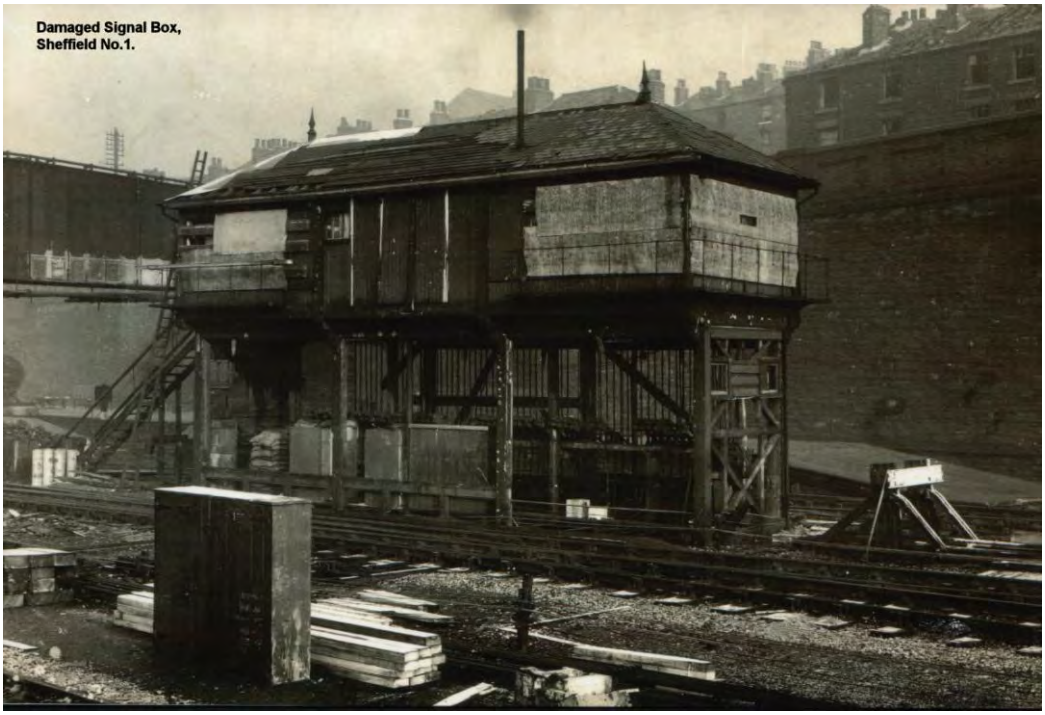


Plate 19
Sheffield South No.1 Signal Box that was completely destroyed on 12th December 1940 in the process of being rebuilt.

Roy Anderson Collection.

Plate 20
The replacement 68 lever frame being erected on Platform 5 on 12th December 1940 for Sheffield South No.1 Signal Box.

Roy Anderson Collection.

Plate 21.
Sheffield South No.2 Signal Box on 12th December 1940 following an enemy air raid with the box having suffered severe bomb damage with all the wood panels blown out together with windows and roof tiles.

Roy Anderson collection

Plate 22.
Sheffield South No.2 as rebuilt taken in 1963 with Sheffield South No.1 in the background that was completely destroyed in the same raid.

Mike King.

Plate 23. Liverpool - Canada Dock Goods Warehouse destroyed by enemy action on 20th/21st December 1940. British Rail

Plate 24. Liverpool – Canada dock Goods Warehouse with the temporary shed erected on the same site.

British Rail

Plate 25

Liverpool – Canada Dock goods yard – 24th December 1940.

British Rail

Plate 26 & 27. Liverpool – Viaduct between Exchange Station and Sandhills damaged by enemy action 20th December 1940. British Rail

.

The viaduct re-constructed

Plate 28. Manchester Exchange Station damaged by enemy action 21st December 1940.

British Rail

Plate 29. Manchester Exchange Station having been made safe and debris removed.

British Rail

Plate 30.
Manchester Exchange Station, No.1 Platform, concourse and roof damaged by enemy action, 22nd December 1940

British Rail

Plate 31.
The same scene as plate 30 with the debris removed. British Rail

Plate 32. Manchester Victoria – 24th December 1940. British Rail

Plate 33.
Manchester, Oldham Road Goods Station – Lees Street Warehouse and Provision Shed destroyed by enemy action on 22nd December 1940.
British Rail

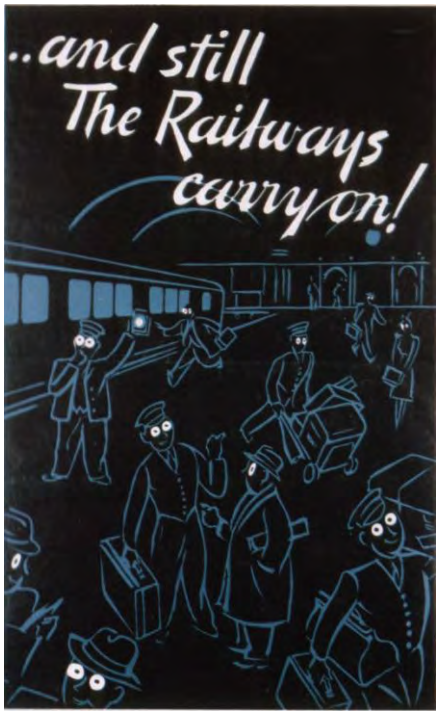
Plate 34. Bridges No.14 and 19, between Manchester Exchange and Ordsall Lane damaged by enemy action on 22nd December 1940. British Rail

Plate 35
The same bridges as on plate 70 following re-construction.
British Rail

Plate 36. The Manchester South Junction and Altrincham Railway, Castlefield Viaduct arches destroyed on 23rd December 1940. British Rail

Plate 37. The Castlefield Viaduct re-constructed. British Rail

Chapter 3 – The Blitz continues - 1941.



Summary

In March and April 1941 London was again the target with severe raids also experienced in the Glasgow and Birmingham areas. The final effort was in May 1941 when sixteen out of the twenty-two Engineering Districts received bombs, with Liverpool, Birkenhead and Barrow and Glasgow being the worst hit. Liverpool and Birkenhead were attacked on seven consecutive nights from 1st to 7th May 1941 that was followed by a heavy raid on London on the night of Saturday 10th May. There were a few lighter raids later, including one on the Nuneaton area on the night of 16th May, and in the Manchester area on 1st June, with this being the last raid of anything like a heavy character affecting the LMS railway. The campaign closed, for all practical purposes with an attack on Manchester on the night of June 1st 1941 which may well be due to the German invasion of the USSR that took place later in that month on June 22nd.

Unexploded Bombs

One of the difficulties experienced during the heavy raids in 1940 and 1941 was the inability to obtain an early inspection of unexploded bombs and expert advice on relaxing standard restrictions. This was usually due to Bomb Reconnaissance Officers being stationed at central points, some distance from the site of the bomb, and to the fact that the number of Officers was inadequate to deal with these incidents promptly. During the lull in enemy activity, the Authorities increased the number of Bomb Reconnaissance Officers by training local wardens, police and railway staff in such duties, and by the end of 1943 the LMS had 108 members of the Chief Civil Engineer's staff, stationed at appropriate centres throughout the system, competent to perform the necessary inspections and give advice.

Comment.

The extent to which the Luftwaffe deliberately set out to damage defined railway targets is a subject of speculation. It might be that in some cases they saw a definite target and bombed it, but if the height at which they were flying, the strength of the defence, or the weather conditions rendered accurate bombing impossible, then they would drop their bombs as best they could in an area known to have vulnerable targets. Certain places were bombed more than once – Queen's Park **(plates 7 & 8)** between Euston and Willesden seemed to possess some attraction, but many important targets escaped totally and it could be considered that many targets were simply hit by chance. Had the enemy wished to destroy Goods Sheds and Warehouses then they did achieve considerable success in Liverpool. Manchester and Birmingham. However if the aim was to paralyse the British railway system, then, as stated earlier, it was a failure, as even the massive damage to Exchange Station, Liverpool and the adjoining viaduct, and to Manchester Victoria and Exchange Stations were nowhere near operating disasters. Having said that credit must go to the ready response of railway officials and staff who rose to the challenge, and in particular to the Engineering, S&T and Operating Departments who co-operated fully in the task of maintaining and restoring communications. The wholesale dislocation on which the pre-war preparations were based never materialised and therefore improvisation and ingenuity was required. Certain key places such as important junctions and bridges were not often bombed and generally speaking damage to them was unexpectedly easy to deal with. Railway communications were not cut to the extent so as to render the peacetime organisation inoperative. Most damage was, in the main, dealt with by the extension and adaptation of normal peacetime procedures, with no particular case being considered as typical but the following will serve as an illustration.

Month 1941	Number of days in month	Number of days LMS affected	Number of days when Raids were heavy.
January	31	12	5
February	28	10	3
March	31	15	7
April	30	13	10
May (to 10th)	10	10	8
Total	**260**	**170**	**97**

Derby - 15th January 1941

High explosive bombs were dropped on Derby Station **(Plates 38 to 40)** – killing four passengers and two staff and injuring three passengers and five staff. The roof over Nos. 4 and 5 platforms was demolished for about 100 yards and damage caused to No. 6 platform, the station footbridge and to roofs and windows of several offices and buildings in the vicinity. Damage was caused to the windows of the Station "A" and Engine Sidings No.2 signal boxes. Nos. 4 and 6 platform colour light signals were destroyed and damage was caused to crossover points between Nos. 3 and 4 platforms. Cables from the station to the Locomotive Works were damaged by blast and wiring circuits to the colour light signals referred to were destroyed. Damage was also sustained to the loud speakers and some open wires were brought down.

Avonmouth - 16th January 1941.

Three boxes were more or less seriously damaged - Dock Junction, Sidings and Dock station boxes. A gantry signal was destroyed, also signal connections and a bracket signal damaged.

Liverpool and Birkenhead – 1940/1

Liverpool and Birkenhead sustained bombing that was both prolonged and concentrated, particularly in December 1940 and March and May 1941. Bombing on 12th to 14th March caused damage at 51 places including 15 instances of line blockage. All the main, branch and dock lines sustained heavy damage, some on several occasions, and important docks, passenger and goods stations, and freight marshalling depots were isolated for long periods, whilst destruction of buildings at passenger and goods stations and the docks was very extensive.

Liverpool – 3rd/4th May. The centres for the new arches on the Sandhills viaduct and the temporary bridges were again destroyed **(Plate 41)** and the slow lines blocked again, with Exchange Station badly damaged. Part of the western wall of the station was blown inwards on to the platforms, causing the collapse of four bays of the main roof on to an electric train and severely damaging two additional bays. The blast damaged all the offices on the west side of the station, most of the roof glazing, and the District Goods Manager's offices were also demolished. The buildings on the eastern side of the station were gutted by incendiary bombs, and a fire in the basement caused the carriageway to collapse. It was not until July 6th that the slow lines from the station and over the viaduct were reopened for electric trains, with a modified steam service following a month later. The fast lines were eventually re-opened on12th April 1942. This was the worst dislocation to an important traffic centre during the whole of the raids, but diversion of traffic to other stations and routes within the vicinity eased the operating difficulties. Had these alternative facilities not been available there is no doubt the repair work could have been speeded up by concentrating on the restoration of lines into Exchange Station, but this would have been at the expense of other important railway facilities in the Liverpool area. Huskisson Goods shed was destroyed **(Plate 42**). There were about ten cases where tunnels were damaged being a rare occurrence, but there were two in Liverpool. ***Spellow Tunnel - 14th March.*** **(Plates 43 & 44)** was hit by two high explosive bombs, and whilst the damaged portion was being repaired it was hit again on 7th May in the great raids in the first week in May. Although single line working was soon possible after each incident it was not until the end of November 1941 that both lines were re-opened. In the latter raid Crown Street Tunnel collapsed as a result of a direct hit. From the S&T viewpoint on ***26th April and 8th May, 1941*** a total of some eighty locations (offices, signal boxes etc.) were damaged, main multi-core cables and all open wires being down in numerous

sections. Twenty signal boxes received damage, with that to Bootle Station and Dale Lane No.2 being considerable. Liverpool Exchange "B" box and gantry were badly damaged by fire. The control Office at Aintree, Telegraph Office at Liverpool Exchange Station and the Telephone Exchange at Canada Dock were demolished, a temporary board installed at Canada Dock again being destroyed in the later raid. Difficulties at the docks were accentuated by prolonged interruption of hydraulic and electric power affecting cranes, capstans etc., and the severance of connections between LMS lines and the Mersey Docks and Harbour Board Estate. The various Goods Offices and Station Telephone Exchanges were interconnected by about fifty Post Office maintained tie lines, and, owing to the extensive damage suffered by the Post Office, chaotic conditions prevailed initially. It was only due to the provision of temporary tie lines by the S&T Engineer's Department over devious railway routes that skeleton inter-communication was afforded within a week or so.
Marsh Lane Station – 4th/8th May was also damaged in these raids. **(Plates 45 & 46).**

Scotland – March and May 1941.
As far as Scotland was concerned, the worst raids affected Glasgow as might be expected. Many bombs fell on the Forth and Clyde Canal during the first raid without causing too much damage. Although there were a great many incidents in the raids, there were not many cases of serious damage, if the standard of the attacks on Liverpool and Manchester was the yardstick.
5th May. The goods sheds at Greenock were the worst affected. Damage was caused to nine signal boxes, those at Greenock Central and Gourock No.1 of a serious nature. Aerial wires were brought down in many places, telephone communication and block working between Langbank and Port Glasgow and between Wemyss Bay Junction and Greenock were made inoperative necessitating all trains being run on a time interval. Study of Table 3 (**page 35)** shows that the combination of attacks on Liverpool and Glasgow in the first week of May 1941 accounted for the highest number of incidents on the LMS for any week, this being the final fling by the enemy on the West Coast ports.

Birmingham Area.
Coventry 8th/10th April. The telephone exchange was completely destroyed and Nos. 2, 3 and 4 signal boxes and connections damaged together with pole routes.
Birmingham 8th/10th April. The windows of eight signal boxes were damaged. One signal gantry was demolished and two other signals blown down. At New Street all communications were cut. Main line blockages were numerous and very serious, and damage considerable. Blockages occurred on the main trunk lines of the Western Division between Stafford and Rugby, and the Midland Division between Derby and Bristol, and the reaction on traffic workings, both passenger and freight was extremely heavy and considerable diversions for important through services were made. In addition the following goods depots were isolated - Lawley Street until the afternoon of 12th April, Curzon Street until mid-day on 11th April with full access not available until 16th and Central Goods until 13th April.

London Area.
Highbury - 19th March. The Liverpool Road over-bridge and retaining wall damaged **(Plates 47 & 48)**
London 16th April 1941 – Sir Josiah Stamp was killed, aged 60, together with his wife Olive Jessie and his son Wilfred Carlyle Stamp.
London, Haggerston 17th April.. The signal box at Haggerston was seriously damaged, also four others to a lesser extent. A signal gantry at Haggerston was demolished. Aerial wires were brought down at several places. At River Rom a District train (empty) received a direct hit and rested on the cables, which fortunately did not affect their working.
Bow works- 19th April. Was hit on 19th April 1941. **(Plate 49).**
London Area - 19th/20th, April. Nine signal boxes received structural damage and broken windows. Aerial wires were brought down and cables damaged at many places. At New Inn Yard signal box, all block and other instruments were put out of order. Plaistow traction sub-station was damaged, putting out of use the signalling equipment.
Barrow-in-Furness – 4th May. There were direct hits on Barrow Central and carriage sidings. The carriage and wagon offices and warehouses were demolished and some forty coaches were damaged.

Main lines were blocked and all communications were down. The station lines were cleared in 29 hours. **(Plate 50).**

London Area - 10th and 11th May. Seven signal boxes were damaged, that at Poplar seriously so. Signals and signal and point connections were damaged, aerial wires brought down and cables destroyed with damage at several other places.

St. Pancras – 10th May – **(Plates 51 to 55).** This was the last heavy raid on London with St. Pancras Station again a heavy sufferer, being closed until 19th May.

Blackpool Central – 27th August. . Blackpool Central was targeted on 27th August 1941 **(Plates 56 & 57)**

Signal Boxes destroyed/seriously damaged by enemy action during 1941.

Avonmouth Dock Junction – 16/17th/1/1941; Haggeston – 17/4/1941; Bootle, Dale Lane No.2 and Liverpool Exchange No.2, all between 26th April and 8th May 1941; Poplar Central 10/11th May/1941.

At the Board meeting held on 29th May 1941, (Minute 4289,) The Chairman, Sir Ernest Lemon, gave details of the damage done at Liverpool, Birmingham and elsewhere and "explained the difficulty experienced in carrying out essential repairs owing to the Governments dilatory system of priorities and licences having regard to the vital nature of railway traffic in the country's war effort". The Board authorised the Chairman to approach the Government with the object of overcoming avoidable delays.

Thereafter the raids tapered off and in the seven months June to December 1941 inclusive, there were only 52 occasions on which damage was done to LMS property.

The following tables are included in respect of the period 19th June 1940 to 31st December 1941.

Table 1 (page 34) lists the passenger and goods stations that were severely damaged.

Table 2 (page 35) shows the dates on which severe air raids occurred on the 10 areas served by the LMS Railway that were principally attacked.

It will be seen that in total, from June 1940 to November 1941, inclusive damage was caused on 1,716 occasions and running lines were obstructed for total of 136,132 hours, with 67 persons killed and 462 injured. An analysis of the 1,716 incidents reveals that 1057 or 62% occurred in the Southern portion of England and Wales (south of a line drawn through Ambergate, Norton Bridge and Shrewsbury) 591 or 34% in the Northern portion and 68 or 4% in Scotland.

Classification of the heavy raids shows the following;-

Area	**Number of incidents in heavy raids**	**Percentage to line total.**
London	425	25
Thames Estuary (east of Bromley).	96	6
Birmingham and Coventry	240	14
Liverpool and Birkenhead	269	16
Manchester	74	4
Clydeside.	50	3
Totals	**1163**	**66**

Following the Battle of Britain, the enemy concentrated on night bombing and the relative scarcity of raids affecting the railway in normal working hours, rendered it unnecessary to apply other sections of ARP measures designed before the war. As a result of the greater part of the staff being away from railway premises during night raids, the rescue squads were not called upon, neither had the trenches and shelters been occupied to anything like that anticipated

The table below shows the number of incidents in each Civil Engineering District – June 1940 to May 1941

District	Permanent way	Bridges and Retaining walls	Buildings	Total
Watford	196	52	283	511
London	173	64	196	433
Liverpool	218	63	106	387
Walsall	158	46	129	333
Manchester	159	30	108	297
Bangor	116	11	89	216
Glasgow	46	10	97	153
Crewe	34	5	41	60
Derby North	34	11	28	73
Derby South	34	4	34	73
Abergavenny	21	1	21	43
Northampton	15	4	22	41
Barrow	19	-	20	39
Leeds	10	5	14	29
Bradford	14	4	4	22
Stoke	10	-	9	19
Blackburn	11	2	5	18
Perth	7	1	6	14
Edinburgh	3	-	4	7
Irvine	-	-	5	5
Lancaster	2	-	2	4
Inverness	-	-	1	1
Total	**1,280**	**313**	**1,204**	**2,797**

Of note was the fact that, although an "Emergency Depot" (as detailed in chapter 1) was often only a few miles away, it was not necessary to call on that emergency organisation. The usefulness of such depots lay in the availability of special stocks of bridge materials, permanent way etc. In general it was crater filling that was usually the major job, whilst damage to bridges and viaducts were not numerous. There were about thirty cases of damage to viaducts, bridges and station roofs where material from the Emergency depots was required. One such case was the repair of Bridge 36 at Bulkington, between Rugby and Nuneaton on the main line to the north. This was a girder bridge carrying three tracks and damaged by a direct hit that smashed one of the main girders and threw two others into the canal. The use of emergency beams enabled both lines to be re-opened within four days, single line working having been instituted within 24 hours of the damage being caused. Emergency material was also used on the wrecked bridges on the North London line, the Sandhills viaduct and several other places.

Rolling Stock.

Whilst the damage to stations, permanent way and buildings etc. has been considered, it is appropriate to enumerate the principal items of movable plant that was destroyed or damaged up to end December 1941.

Category	Destroyed	Damaged
Locomotives	1	40 Heavily damaged
Steam, electric & other coaching vehicles	151	2473
Wagons – railway owned	1038	5271
Goods motors	24	104
Parcels motors	2	34
Mechanical-horse tractors	8	105
Mechanical horse trailers	43	73
Drays	637	367
Horses	21	32 Injured.

Table 1 - List of passenger and goods stations severely damaged – 19th June 1940 to 31st December 1941.

Passenger Stations

London Area
St.Pancras
Euston
Hampstead Heath
Highbury
St. Quintin Park
Kensington (Addison Road)
West Ham
Gospel Oak
Caladonian Road & Barnsbury
Poplar
Bow
Whitecross Street (Parcels)
West End Lane

Birmingham Area
New Street
Coventry
Vauxhall
Coleshill
Moseley

Liverpool Area
Exchange
Marsh Lane
Canada Dock
Breck Road
Kirkdale

Manchester Area
Exchange
Victoria
Mayfield
Pendleton (Old)

Other stations
Bristol St. Phillip's
Sheffield
Attercliffe Road
Derby
Swansea Victoria
Holbeck
Renfrew Wharf
Grays
Nottingham
Barrow Central

Total – 37

Goods Stations

London Area
St Pancras
Somers Town
Haydon Square
Poplar 'A'
Poplar 'B'
Broad Street
Canning Town
Commercial Road

Birkenhead
Egerton Dock
Cathcart Street.

Liverpool Area
Alexandra Dock
Brunswick Dock
Sandon Dock
Canada Dock
South Dock
Waterloo Dock
Garston Dock
Edge Hill
Park Lane
Bankfield
North Mersey

Birmingham Area
Curzon Street
Lawley Street
Central
Spon Lane
Coventry

Manchester Area
Salford
(Stone Jug & New Bailey Street)

Other Stations
Barrow
Bristol St. Phillips
Avonside
Heaton Norris
Leeds Wellington St.
Leicester
Nottingham Manvers St.
Sheffield (Queen's Rd)
Sheffield (Wicker)
Sheffield Nunnery
Stoke Works
Broadheath

Total 40.

Table 2. shows the dates on which severe air raids occurred on the ten areas served by the LMS Railway – June 1940 to June 1941. (Day raids shown 8th etc. Night raids shown 13/14).

Year	London Area	Thames Estuary	Birmingham and Coventry	Manchester	Liverpool and Birkenhead	Leeds	Sheffield	Swansea	Bristol	Clydeside
1940 June									24/25	
July										
August		18th 26th 31st	25/26 26/27					17/18	13/14	
Sept.	7th, 7/8, 8/9, 9/10 10/11, 15/16 17/18, 21/22 25/26, 27/28 28/29, 29/30 31/1st. Oct.	7th. 15th 15/16 27/28			4/5 18/19 21/22 26/27 29/30			1/2		
Oct.	1/2, 2/3 4/5, 5/6 8/9, 9/10 10/11, 13/14 14/15, 15/16 16/17, 19/20 21/22, 23/24	14/15 15/16	12/13, 16/17 17/18, 18/19 21/22, 14/15 25/26, 26/27 28/29, 31/1 Nov.	2/3 7/8	11/12					
Nov.r	7/8, 15/16 16/17		14/15, 19/20 22/23		28/29				24/25	
Dec.	¾, 8/9 29/30		3/4, 11/12	22/23 23/24	20/21, 21/22 22/23		12/13 15/16		6/7	
1941 Jan.	5/6 11/12	12/13			9/10				26/17	
Feb.								19/20 20/21 21/22		
March	8/9, 19/20	8/9 19/20		11/12	12/13, 13/14 14/15	14/15			16/17	13/14
April	16/17, 17/18 19/20	16/17, 19/20	8/9, 9/10 10/11		15/16, 26/27				11/12	7/8
May	10/11		16/17	7/8	7 cons. nights 1/ 2 to 7/8 inc. 31/1 June					5/6, 6/7
June					1/2					

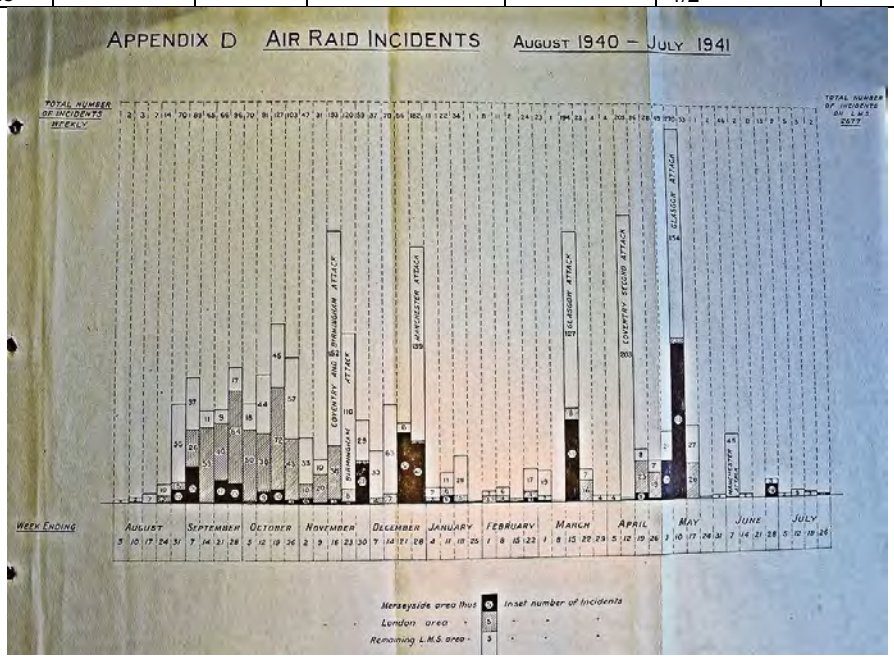


Figure 1 - showing the Air raid incidents - August 1940 to July 1941.

Plate 38
Derby Station was damaged on 15th January 1941.

British Rail

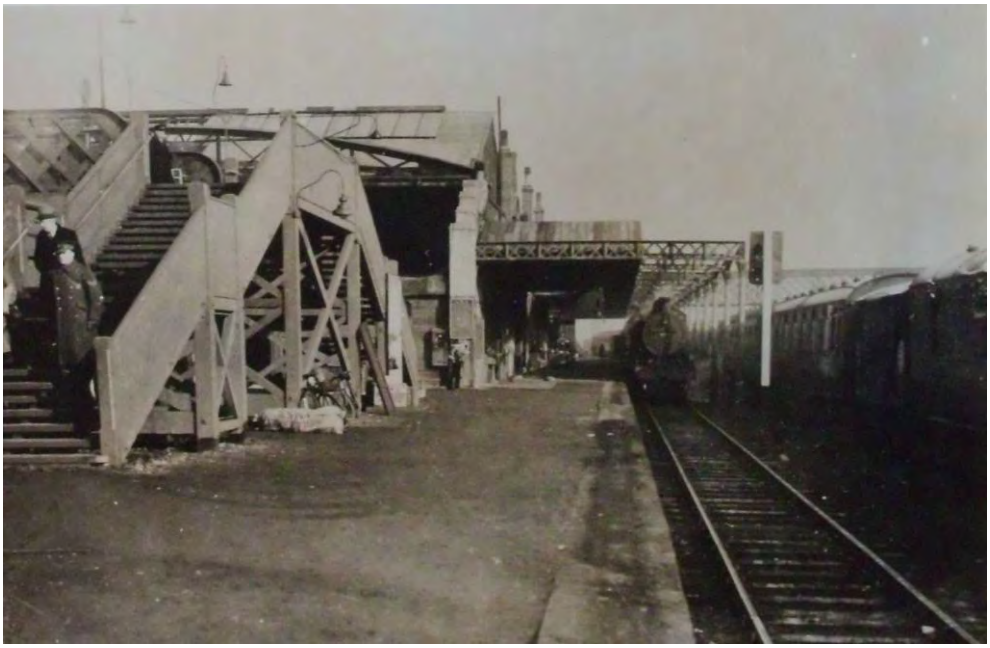


Plate 39.
Derby Station, with the debris removes and a temporary footbridge in place.

British Rail

Plate 40.
A further view of the damage caused at Derby Station on 15th January 1941.

British Rail

Plate 41.
The Liverpool Exchange viaduct was once again the recipient of enemy attention on 3rd May 1941.
British Rail

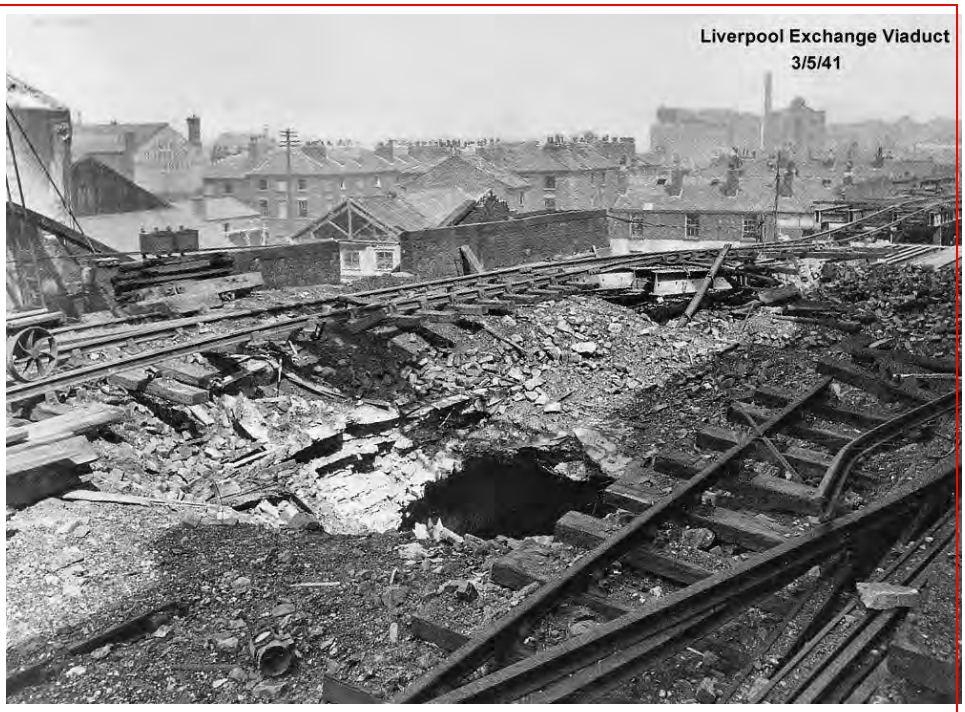


Plate 42.
Liverpool, Huskisson Dock targeted on 3rd May, 1941.
British Rail

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Plate 43.
Liverpool, Bootle Branch, Spellow Tunnel Damaged on 14th March 1941.
British Rail

Plate 44.
Liverpool, Spellow Tunnel hit for a second time on 7th May 1941.

British Rail

Plate 45.
Marsh Lane Station on the Liverpool – Southport electrified line damaged by enemy action 4th – 8th May 1941.

British Rail

Plate 46. **M**arsh Lane Station with the platform reconstructed. British Rail

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Plate 47.
London, Highbury Liverpool Road Bridge and retaining wall damaged by enemy action 19th/20th March 1941
British Rail

Plate 48.
The Highbury Bridge and retaining wall following its re-construction.
British Rail

Plate 49. Bow Works was severely damaged on the Tilbury Section on 19th April 1941. British Rail

Plate 50
Barrow Station was attacked on 5th May seen here following tidying up.
British Rail

Plate 51 The last heavy raid on London on 11th May saw much damage to St. Pancras Station as plates 51 to 55 portray.
British Rail

Plate 52.
St. Pancras – 11th May 1941.
British Rail

Plate 53.
St. Pancras – 11th May.
British Rail

Plate 54. St. Pancras – 11th May 1941 British Rail

Plate 55.
St. Pancras, Somers Town Goods was hit and damaged as this picture shows – 11th May 1941
British Rail

Plate 57 & 57.
Blackpool Central received a visit from the enemy on 27th August 1941. British Rail

Chapter 4 – 1942 to 1945 - Bombs, Flying Bombs and Rockets.

Bomb Damage - 1942

The technique of air attack on Great Britain changed during the latter part of 1942 from spasmodic bombing at lengthy intervals and isolated daylight raids by single enemy aircraft to sneak raid attacks, mainly on coastal areas, by fast fighter bombers coming in at zero height to elude the defences. The London area and the Thames Estuary also experienced small scale attacks in the latter part of 1943, which failed to have any appreciable effect on the normal operation of the railway. In 1942, 70 incidents affected the LMS. 46 or 66% occurring during six fairly heavy raids, the areas affected being Bath on two occasions, Birmingham also twice, Nuneaton and Wolverhampton. Phosphorous bombs were dropped at the latter place on 30th/31st July, the first such experience of this type on LMS property.

Luton – 5th September, 1942. This was the most serious of the daylight raids by single aircraft when a high explosive bomb fell in the public highway to the Goods Yard, causing extensive damage to the warehouse, offices, etc. Six staff were injured. Other cases of serious damage to property occurred during 1942 as follows:-

Bath – 25th April, 1942. Grain shed destroyed by fire. Goods Offices demolished and extensive damage to roofs of the Locomotive Shed and Offices. The Passenger Station buildings were also damaged.

Stockingford – 25th June 1942. Roof of warehouse extensively damaged.

Vauxhall, Birmingham 30th - July 1942. Passenger Station and Booking Office seriously damaged by fire.

Lawley Street, Birmingham - 30 July 1942. Offices and buildings extensively damaged by a high explosive bomb.

Templecombe Upper (S&D Joint) - 5th September 1942. The Southern Railway Company's portion of the Joint Station was extensively damaged by a high explosive bomb.

In none of these cases were lines blocked or the permanent way damaged and during 1942 no member of the staff was killed on LMS Property but 13 were injured. Up to December 1942 the damage to all the Railway Companies was estimated to be £19,250,000, the LMS amount, including Joint Lines being £4,660,000. At this time the Government Bill dealing with damage to Public Utility Undertaking had still to be submitted to Parliament. The LMS was therefore using its own cash resources totalling £2,149,337 up to the end of 1942, mainly on repair work.

In 1943 the number of incidents affecting the LMS further declined to 24, mainly in the London area and the Thames Estuary, damage was generally light and there were no casualties. The only instance of serious damage took place at Swansea, St. Thomas, when high explosive bombs damaged the roof of the station and the old Midland warehouse at the Eastern Depot.

Moving on to 1944, with the invasion of France imminent, the Government anticipated heavy air attacks, and to ensure that essential rail and road traffic was not delayed during the crucial period of military operations, decided that some risk would need to be taken with respect to unexploded bombs. In May 1944 special instructions were issued to the District Controllers and District Engineers setting out certain modifications to the standard regulations applicable to the working of trains past unexploded bombs. These relaxations were based on the knowledge gained of the fuses used by the enemy. The new instructions were to be regarded as most secret in case the enemy obtained a copy and thus revised their tactics. In the event no such heavy bombing took place and neither did the gassing of the invasion ports or the feeder lines of communication as was anticipated. Following a lapse of two months the Government decided that there was no further justification for the continuance of these special instructions that were cancelled on and from 30th August 1944.

Comment in the Operating Managers Report for the period to 1943

"This chapter cannot be closed without paying tribute to those of all grades of the Operating Department. Railwaymen of the operating grades were more in the firing line than in any other industry, as the traffic continued to run after danger was imminent, whilst gun-fire was intensive and bombs were falling. No one, other than the men them-selves, can fully appreciate what it meant to be a Driver or Fireman of a train approaching London or any provincial city at night, with the sky full of bursting shells or be a Driver, Fireman or Guard of a train brought to a stand at a signal box with bombs of all kinds dropping in the immediate vicinity. Again, how many people would, during a raid, have cared to take the place of a signalman in an elevated box, or to be a shunter in the open without any overhead protection? But it is almost invidious to mention particular grades, because in all branches – on the passenger stations, in the traffic yards, at the locomotive depots, in the goods sheds, and elsewhere – work went on. One could not but feel a thrill of pride when, during the nightly din of bursting bombs and gunfire, with the glare of fires telling their woeful tale of destruction, there constantly emerged the sounds of running trains and shunting movements of "the service that never sleeps". But the price of this devotion to duty had to be paid, and whilst any loss of life was deeply regretted, it will probably be a matter of surprise, having regard to the large numbers employed, that only 48 railwaymen were killed on duty, perhaps it was a case of "fortune favours the brave". By carrying on with their jobs, railwaymen performed acts of bravery every day, but they also distinguished themselves by the precision with which they tackled fire-bombs and by the more specific feats which could be singled out for official recognition. Railway men also played their part in the performance of acts of bravery as members of the Civil Defence Services as civilians, for which awards were granted".

Bomb Damage - 1944 .

Enemy air activity increased using piloted aircraft during the first three months of the year mainly in the London area, the heaviest attacks being on 19th and 20th February. On 19th main lines were blocked at ten places and extensive damage was done by high explosive bombs to station buildings at Canonbury and West Hampstead. During the period from 1st January to 14th June there were 83 incidents causing damage, including 32 occasions on which running lines were obstructed.

Canonbury and West Hampstead Passenger Stations - 19th February 1944. Extensive damage caused by high explosive bombs.

St. Pancras –15th March 1944. Canley Street Stables heavily damaged with two horses killed.

Flying Bombs - 1944.

On 13th June the Germans introduced the use of 'flying bombs' that were a mid-wing pilot-less jet propelled monoplane, the jet propulsion unit being mounted above the rear portion of the fuselage. The overall length was 25' 4 1/2" with the wingspan varying from 16' to 17' 6", the warhead containing approximately 1,700 lbs of high explosive. These projectiles were used daily against Southern England, including the Greater London area until 31st August with the sole exception of 26th August. Altogether there were 128 flying bomb incidents on the LMS, During the peak period from the middle of June until the end of August, the missiles were sent over at short intervals by day and night especially during poor visibility, and on the 24th August there were no less than 13 'Imminent' Danger warnings between 17.50 and 21.15, the peak period for the forwarding of traffic at the main London Goods Depots. In the twelve-week period from week-ended 18th June ending on 3rd September "*Red*" warnings operated in the Central London area for 645¼ hours or 32% of the time. The first flying bomb that caused damage to LMS property burst at Poplar on the 16th June 1944. In order to combat the Flying Bomb it was decided to utilise 3.7" heavy anti-aircraft guns, and to this effect 76 were moved in five special trains from Scotland, Newcastle, Leeds and Sheffield to the South Coast within a period of ten days. In all 155 flying bombs damaged LMS property, of which 133 were in the London area. When war broke out the Nations householders were given the option of receiving one of two types of air raid shelters. One was the 'Anderson' shelter of galvanised corrugated iron construction for partially burying in the garden and covered over with earth. The second was the 'Morrison' type for use indoors that one slept under. With the range 'Flying Bombs' limited to the London area an appeal was made for those resident in the north to dismantle their indoor type for dispatch to London to meet the emergency. The total brought to London by the LMS was 37,868.

None of the cases caused damage comparable to the worst incidents from the earlier mixture of high explosive and incendiary bombs.
The worst cases are listed below:-
Poplar – 16th June 1944. Station buildings, platforms, staff rooms, two signal boxes, retaining walls and sidings damaged.
Fenchurch Street – 18th June 1944. Control Office windows, doors, ceilings etc damaged by blast.
Wembley – 3rd July 1944. Flying bomb dropped in 6ft. way between up and down electric lines, causing damage to Sudbury Junction signal box and serious damage to the permanent way. The down line was blocked from 19.07 until 15.08 on the 4th and the up line until 18.15 on that date.
Somers Town Goods and St. Pancras Passenger Stations – 5th July 1944 (**Plate 56).** A flying bomb fell on Ricketts' Wharf, causing damage to crane, coal shutes, shed, the permanent way of four sidings, and to 67 wagons. Windows of the goods and passenger station buildings were broken. Thirteen passengers and eighteen members of the staff sustained minor injuries or shock.
Kilburn – 24th July 1944. A flying bomb dropped in Cambridge Road at the time the 10.00 express train from Blackpool to Euston was approaching. Thirteen coaches had windows and fittings badly damaged, whist 56 passengers were injured.
Purfleet – 24th July 1944. A flying bomb fell in the 6' 0" way as a military freight train was leaving the sidings. Forty five wagons sustained damage.
Commercial Road Goods – 1st August 1944. General Delivery Office and 20-ton wagon hoist demolished and thirty wagons smashed. Fourteen staff and nineteen USA personnel were injured or sustained shock.

On 24th December 1944 the enemy made his first attack with flying bombs on Northern England ie that part of the country north of a line from the Wash to the Severn Estuary. Slight damage was caused to the Company's property at Stockport (Davenport Junction), Radcliffe Bridge, and Killamarsh. On the morning of 29th December air raid alerts were also sounded in the Liverpool, Manchester, Crewe, Wigan, Macclesfield and Sheffield areas. The severity of the flying bomb attacks can be gauged by the time warnings operated in the Central London area. From the beginning of the attacks until 3rd September (12 weeks), warnings were in operation for 646 hours, or 32% of the total hours for this period, the worst week being that ending on 9th July when alerts were in operation for 98 of the 168 hours, or 58.3%. In all 116 members of the staff sustained injury or shock during the course of their duties, but no fatalities occurred. The staff most at risk were the cartage staff, who were bound to be out on the streets without shelter, and in many cases in charge of horse vehicles. The fears were not unfounded as 24 van men, carters, etc including six females, were injured whilst on duty. During certain periods of those attacks it was necessary to restrict the forwarding of certain traffic to the London Goods Depots.

<u>The 1944 Voluntary Evacuations from Flying Bombs and Rockets.</u>
With the advent of flying bombs and rockets in 1944 a limited amount of voluntary evacuations took place of school children and some mothers to the Midlands and the North. This became apparent when, on 24th June 1944 both the 12.00 train from St. Pancras to Bradford and the 14.40 from Euston to Liverpool were seriously overcrowded with passengers standing and each leaving 100 passengers behind. The following day was much worse, as following the departure of the 10.00 train from St. Pancras there were still 700 passengers awaiting the midday service. At Euston the situation was no different with the platforms packed throughout the morning and afternoon. There was at this time restrictions on the running of additional passenger trains but the Ministry of War Transport gave permission to run relief trains for bona fide evacuees and three trains ran on Saturday 1st July being the 09.45 St. Pancras to Leeds, 09.50 Euston to Manchester and 12.05 Euston to Manchester. However it became evident that further trains were required and authority was obtained for seven further trains on 1st July that ran from Euston or St. Pancras to Manchester, Liverpool, Leeds, Derby and Leicester with an approximate total of 5,950 passengers. Interestingly permission was given to run what would have been empty stock trains back to London as up main line relief trains, provided discretion was used.

Rockets 1944/5, the Final Attacks and Hostilities in Europe Cease.

In the early part of September 1944 the enemy supplemented the flying bomb with long- range rockets. These missiles were projected by rocket propulsion into the stratosphere to fall like a shell at a very much higher speed and at an angle of about 60 degrees to the horizontal. They measured some 45' 10" long by 5' 6" wide (11'9" including the fins) and contained a warhead similar to that of the flying bomb in that it weighed about 2000lbs. The rockets were sent over at varying times during the 24 hours of the day, and, as no air raid warning was given, they were not detected by any existing device. No defence measures could therefore be brought into operation with trains running at normal speeds and the working of stations and goods depots continued. For a long time the Government did not admit their existence, that was, until the German wireless made a definite statement that they were being used and had fallen in England, following which an official announcement was made. Interestingly, in November 1944, the Germans announced that Euston Station had been demolished by one of their rockets, which, like many others, was untrue thus leaving the LMS to design a new Euston Station without the assistance of the enemy. Altogether there were 128 flying bomb and 13 rocket incidents on the LMS with fifteen flying bombs and thirteen rockets being direct hits. Damage was caused by 51 such rockets, all in the London area. The first case being on 11th October 1944, at Bow Works

Bow Works – 13th October 1944. The wagon shop at Bow Works was virtually demolished, with the roofs of most of the other buildings blown off by the explosion.

Tilbury Riverside – 14th December 1944. Rocket projectiles fell in East Sidings causing considerable damage to the passenger station, sidings, refreshment rooms, goods shed and offices. In addition 142 coaches and 13 freight wagons were damaged. Of the 142 coaching vehicles affected, 26 formed part of two ambulance trains stabled in the sidings. Four staff members and seven War Department personnel attached to the ambulance train were injured.

West End Lane - 8th January 1945. A rocket fell on the permanent way cutting the up and down lines. Shuttle electric services were instituted between Broad Street and Hampstead Heath and Brondesbury and Richmond. Windows were broken in two coaches of the 10.08 express from Bradford to St. Pancras that was in the vicinity on the Midland Division line at the time. Lines were blocked for 24 hours.

Bow - 13th January 1945. A rocket demolished the Wagon Works and damaged the Locomotive Works. The lines between Poplar and Bow and the entrance to Devon's Road Motive Power Depot were blocked by debris. Blast damaged an LPTB electric train at Bromley (LTS Section), injuring 30 passengers, one of whom died the following day.

Dagenham Dock – 7th February 1945. A rocket fell in Ripple Lane down Sidings making the largest LMS crater being 40 feet deep and 120 feet in diameter. The up and down lines were obstructed by debris and the permanent way in the down line was damaged. Twenty-two wagons were damaged.

West Ham and Plaistow – 28th February 1945. A rocket fell in the down sidings. The down local line and three sidings sustained damage together with 29 wagons and 5 brake vans. The roof was blown off the Booking Hall at West Ham and the other station buildings suffered damage.

East Horndon - 8th March 1945. A rocket fell in Laindon Cutting damaging the down line. The up and down lines were closed to traffic from 20.20 to 03.00 the following day.

Dagenham Dock – 17th March 1945. A rocket fell in Ripple Lane down Sidings causing a 50 feet diameter crater with 3 brake vans and 21 wagons damaged.

Hornchurch - 26th March 1945. This was the final recorded rocket recorded to fall on LMS property.

The last major attack on Britain was made on the nights of 3/4th and 4/5th of March 1945 when around 70 planes flew to convey and launch V1 missiles In total 170 V1 Flying bombs and V2 rockets fell on the LMS as listed below..

Analysis of Damage Caused by Flying Bombs and Rockets 1944 /45.

Area	Flying Bombs	Rockets	Total
London	32 (6)	23 (6)	55
Thames estuary	86 (9)	17 (2)	103
Elsewhere	11	1	12
Total	**129**	**41**	**170**

The figures in brackets indicate the direct hits on the railway.

The General Air Raid Warning System and the Industrial Alarm warning arrangements were cancelled on the 2nd May 1945. The last "alerts" given in the country were at Aberdeen and Forfar on the afternoon of Monday 30th April. The total number of "Red" warnings issued in the Central London Area throughout the war was 1,227 and the longest period of consecutive days on which warnings were given in the same zone was from 23rd August 1940 to 1st December 1940, a total of 101. The largest number of "Red" warnings in one day was 23 on 3rd August 1944. Folkestone has the overall warning record with 2,643 warnings. On 2nd May 1945 instructions were issued for the return of all ARP equipment to the General Stores Department, when later, arrangement were made for the staff to purchase certain of this equipment such as gum boots, oilskin coats, beds etc.

The final table of damage done to the LMS Railway by bombs, flying bombs and rockets was as below -

Civil Engr's District	Permanent way	Bridges and Retaining walls	Buildings	Total
Watford	242	83	400	725
London	205	53	280	538
Liverpool	218	63	106	387
Walsall	159	46	130	335
Manchester	159	30	110	299
Bangor	116	11	89	216
Glasgow	48	10	100	158
Crewe	34	5	41	80
Derby North	34	4	35	73
Derby South	34	11	28	73
Abergavenny	21	1	22	44
Northampton	16	4	23	43
Barrow	19	-	20	39
Leeds	10	5	14	29
Bradford	14	4	4	22
Stoke	10	-	9	19
Blackburn	11	2	8	21
Perth	7	1	8	16
Edinburgh	3	-	4	7
Irvine	-	-	5	5
Lancaster	2	-	2	4
Inverness	-	-	1	1
Total	**1,362**	**333**	**1,439**	**3,134**

Analysis of the Number of Incidents 1939 to 1945.

Area	Number of Incidents	Percentage of Total
London	593	28.7
Thames Estuary (East of Bromley).	188	9.1
Coventry, Birmingham, Wolverhampton.	277	13.4
Manchester	74	3.6
Liverpool and Merseyside	269	13.1
Clydeside.	60	2.9
Rest of England and Wales.	592	28.7
Rest of Scotland.	10	0.5
Total	**2063**	**100.0**

Damages and Blockages by Enemy Action 1939 to 1945.

	1939	1940	1941	1942	1943	1944	1945	Total
No. of occasions damage was caused	Nil	1,140	576	70	24	224	29	2,063
No. of occasions running lines were obstructed	Nil	447	204	26	5	35	8	725
No. of hours lines were blocked	Nil	43,999	92,133	6,497	99	638	98	143,464

To sum up – from all the foregoing much of the preparation made to combat air raids was never tested, the trenches were rarely used and neither was poison gas and even the emergency depots were hardly ever called upon to anywhere near the extent envisaged.
Notwithstanding – if these thorough preparations had not been made, just consider the public outcry and the consequences, had the air attacks been as expected. All three Departments, Civil, Operating and S & T, all did a first class job in keeping traffic moving and stations open.
On the lighter side – for many years the LMS was the custodian of a faked showpiece, alleged to be the fossilised remains of Ossian, one of the legendry giants who built the Giants Causeway in Northern Ireland. He was eight feet tall and weighed almost three tons. In 1876 he became a ward in Chancery of the old LNWR, following an ownership dispute between Showmen partners. An appeal to the Courts by the Company, to secure disposal against storage charges was dismissed and Ossian enjoyed a tranquil existence for the next 64 years, firstly at Broad Street and later Worship Street Station in London. At £11 5s a year, storage charges reached over £700 until the night of 14th October when Ossian was blitzed and could not be put back together, finally filling a crater made by a bomb – and there were no mourners.

The Evacuees Return.
In April 1945 there were 500,000 evacuees in safer areas of the country and plans were formulated to return these in 610 special trains of which 200 were on the LMS. In the event it was found that most of the evacuees made their own way home and the special arrangements were scrapped, and when the LMS ran 35 long distance trains for the purpose, the number who travelled did not reach expectations. In all the LMS ran 2,036 special evacuee trains during the war conveying 840,512 evacuees. Hospital patients had all returned towards the end of 1944 and from July 9th to 16th October 13 loaded journeys were made, the furthest being from Brechin. In 1945 evacuees drifted back from America and the Colonies, generally to the Mersey, and a total of nine specials were provided for this purpose. Staffs of certain Government Departments returned to London from their evacuated headquarters, one case being the Ministry of Food from Colwyn Bay that required two special trains for the 1000 members of staff and families. Seven special trains were required between July and October 1945 for about 5,000 persons to return Channel Islanders to Southampton and reserved accommodation was provided on ordinary trains for smaller parties.

Air Raid Casualties.

The idea of the Germans to defeat Britain by the use of air raids in 1940/1 was a complete failure and the V1flying bomb and V2 rockets came too late to make a meaningful difference. Statistically the Luftwaffe dropped some 64,393 tonnes of high explosive bombs from aircraft, 5,823 tonnes as Flying Bombs and 1,054 as Rockets with 3,500 shells fired across the channel onto the Dover area. The final estimation of the number of people killed or seriously injured was 116,293 of which 80,397 were in London and 35,896 in the provinces, with the total number killed being 60,595 with damage caused to over 1 million homes.

The First World War – 1914-1918.

By comparison as far as the 1914/18 war was concerned, there were 108 air raids on Great Britain, of which 29 were on Kent or at least got no further than Kent. This left 79 raids that could have affected other railways. Of the 79 raids, 49 were by Zeppelin and 30 by aeroplanes, and due to their limited range were of short duration. On the LNWR, Euston was damaged five times, mainly broken glass and damaged slates. Only some 12 incidents were reported, the worst being at Wednesbury on 31st January 1916 when the permanent way, a retaining wall, a platelayers hut, a goods shed, a weighing machine and signals were all more or less damaged. The Midland Railway records stated - "Sleeper slightly split". In the case of an air raid on 10th May 1915, it stated an incendiary bomb fell on the line between Leigh and Southend when "two sleepers scorched". In all there were 19 instances mostly concerning broken telegraph and telephone wires or panes of glass.

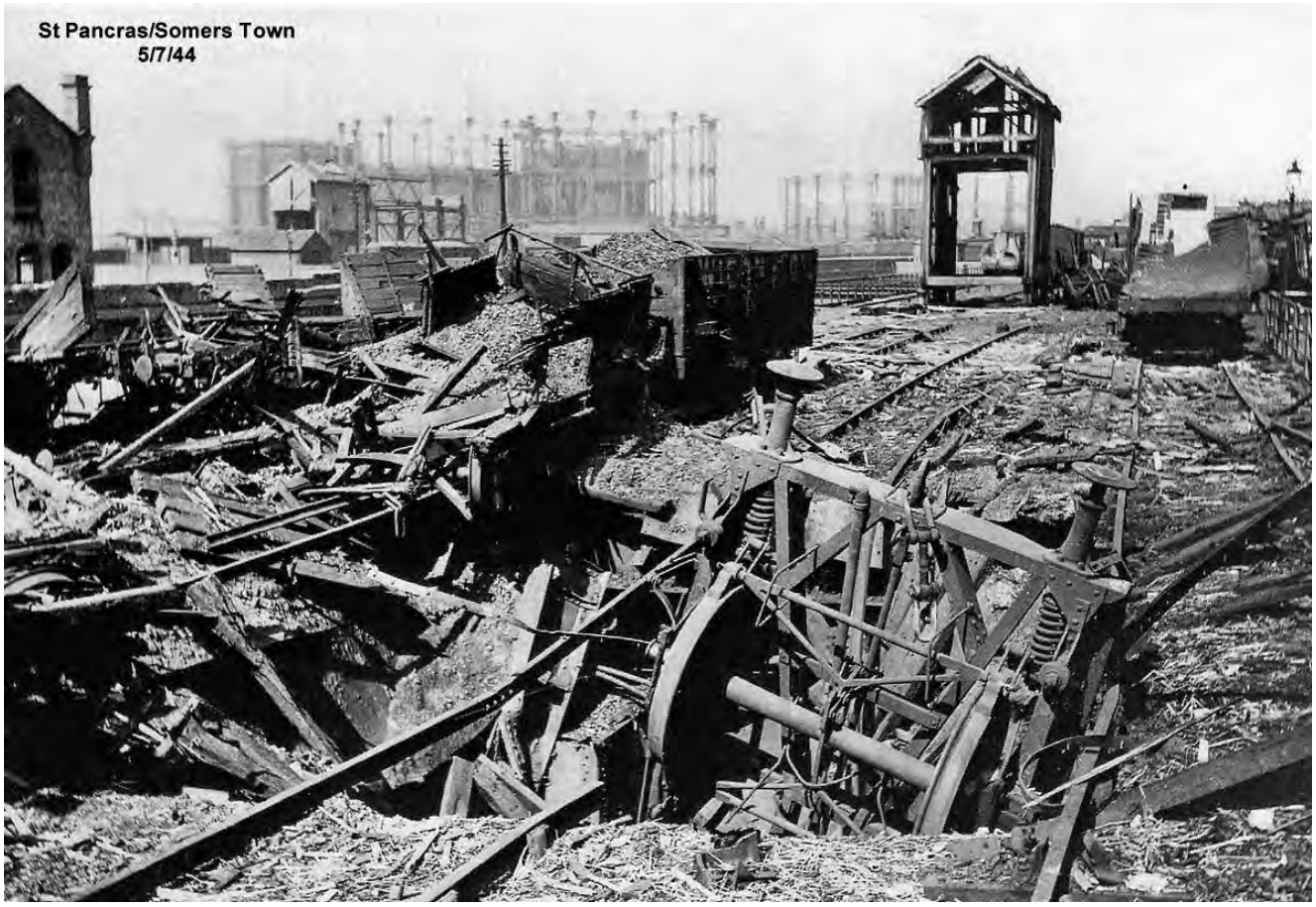


Plate 56.

Damage at Somers Town Goods on 5th July 1944.

British Rail

A summary of incidents affecting the LMS in the South West of England.

Bristol - The first bomb to fall on the LMS damaged Bristol Engine Shed Signal box at 00.51 on ***24/5 June 1940.*** – One line was closed for 21 hours.
At the same time St. Phillips Goods shed was damaged by incendiary bombs.
First of 6 major raids on Bristol was on ***24th November 1940*** when 134 bombers dropped 161 tonnes of HE bombs and 12,500 incendiary bombs there were 197 people killed and 144 seriously injured.
The LMS St. Phillip's Goods shed was completely gutted and the passenger station damaged. The LMS Docks Siding warehouse was demolished together with the District Offices. An unexploded bomb did explode the following day near Engine Shed signal box when all LMS trains were worked from either Fishponds or Mangotsfield until the morning of 2nd December.
The second major attack on Bristol took place ***one week later*** with 140 tonnes of HE bombs and 22.000 Incendiary bombs. The LMS incurred damage at Clifton Down and Westerleigh Sidings where one member of staff was injured by an oil bomb. Damage at Yate on the LMS was confined to the down line that was closed but soon repaired.
On 3rd January 1941 - 178 bombers dropped 154 tonnes of high explosive and 53,600 Incendiary bombs.
On 17th January 1941 - 126 aircraft were involved with the Feeder Road Power station destroyed.
On 16th March 1941 - 162 enemy aircraft were involved with 166 tonnes of HE bombs and 34,000 Incendiaries. At 22.40 Fishponds station and offices were set alight and next day an unexploded bomb exploded damaging a bridge with the up line cleared 53 hours later.
The last serious attack was on ***3rd April 1941***, known as the 'Good Friday Blitz' when about 155 planes dropped 193 tonnes of HE bombs and 25,000 incendiary bombs.
In all these raids the GWR incurred the most damage with Temple Meads much affected.
Bath – The main raid on Bath was on ***25th April 1942*** with 151 sorties dropping 93 tonnes of HE bombs and 3,500 incendiaries and ***26th April 1942*** with 100 planes involved. Bristol was also hit by mistake. The GWR suffered the most damage but the S&D section of the LMS incurred damage to the loco shed and control office. Queen's Square station (later named Green Park) was damaged on both nights.

Avonmouth – St. Andrews Junction Signal Box and 50 wagons at 23.00 on ***14th July 1940.***
On ***4th April 1941*** 83 aircraft dropped 80 tonnes of HE bombs and 20,000 incendiary bombs.
Templecombe S&D – 5th September 1942 the Joint station was damaged by a HE bomb.
Henstridge (S&D) – 13th March 1944. At 14.35 near Henstridge, a USA Army lorry with trailer on the main A30 road veered off and crashed through the parapet of a hump backed bridge over the single track S&D line. At that same moment a delayed double-headed southbound troop train had just reached the bridge, with the result that the trailer landed between the two engines, but mainly on the tender of the leading engine (an SR 4-4-0). The engine broke away from its tender and continued on, still on the rails, until the shocked but otherwise unhurt crew brought it to a halt not far from the station. The train engine, (an LMS 0-6-0), and the five leading coaches were derailed. Five passengers were seriously hurt and nine less so, with the engine crews suffering severe shock. The motor section of the vehicle fell onto the line-side, the driver being killed and the other occupant sustaining severe injuries. The single line was blocked for 24 hours.

Appendices.

Appendix A - Lines blocked by enemy action in the London area from August to November 1940 as extracted from TNA Rail 418/197.

Wembley to Euston.

1940	Place	Lines Blocked	Days	Hours
September				
9th	Euston	Up & down fast Up & down slow		2 2
12th	Camden	Up & down fast	1	12
12th	Willesden	Up & down fast		3
14th	Chalk Farm	Up & down electric		8
22nd	Camden	Up & down fast Up & down slow		3 3
26th	Camden	Up & down fast Up & down slow		2.5 2.5
27th	Chalk Farm	Up fast Down fast Up slow Down slow		11 6.5 11.5 6.5
29th	Harlesden	Up & down electric	7	17
29th	Willesden	Up & down fast		4
October				
2nd	Willesden (New)	Up and down electric		5
8th	Kilburn (High Road)	Up & down fast Up & down slow		21 15.5
12th	Kensal Green	Up electric	14	15
15th	Queen's park	Up & down fast Down slow	4	21 18
15th	Queen's Park	Up electric Down electric	5 1	8.5 15
November				
6th	Queen's Park	Up electric	3	14.5
7th	Kensal Green	Up & down slow	14	1
16th	Wembley	Up slow Down slow		10 11
18rd	Wembley	Up & down fast Up & down slow		8.5 2
23rd	Willesden	Up fast Down fast Up slow Down slow		9.5 1 1 10

North London Section

Willesden to Broad Street via Hampstead Heath and including the short section from Chalk Farm to Camden Town

1940 September	Place	Lines Blocked	Days	Hours
8th	Between Dalston Junc. and Haggerton	No.1 up & down No.2 ditto		15 3.5
9th	Broad St.	No.1 up & down No.2 ditto		8 8
13th	Canonbury	Up & down		3
18th	Dalston Junc,	Up & down		11
18th	Broad Street	No.1 up & down No.2 ditto		9.5 9.5

19th	Between Camden Town And Chalk Farm	Up & down		3
21st	Dalston	No. 1 up & down No.2 ditto		5.5 5.5
22nd	Haggerston	No. 1 up & Down No.2 ditto		15 11
24th	Camden Town	Up & down		4.5
26th	Camden Town	Up Down		13 16.5
26th	Chalk Farm	Up Down		14.5 17.5
27th	Camden Town	Up & down		10.5
27th	Broad Street	No.1 up & down No.2 up No.2 down		2 9.5 15.5
27th	Brondesbury	Up & down		1.5
October				
1st	Finchley Road	Up Down	103 3	8 22
2nd	Between Dalston and Canonbury	No. 1 up & down No.2 ditto		0.5 14.5
9th	Willesden	Up goods Down goods	1 1	5.5 11
10th	Willesden	Up goods	8	14
13th	Dalston Junc.	No.1 up & down No.2 up & down	1 7	3 22
13th	Shoreditch	No. 1 up & down No.2 up No.2 down	488 12 1	18 7 3
13th	Hampstead Heath	Up Down	20 3	20 19.5
14th	Highbury	No.2 up & down		13.5
14th	Broad Street	No.1 up & down No.2 ditto	487 27	10 18
15th	Camden Town	No.1 up & down No.2 ditto		10.5 10.5
15th	Camden Town	Up & down		4.5
15th	Chalk Farm	Up Down	4 2	21.5 14.5
15th	Camden Town	No.1 up & down		16
19th	Canonbury	No.1 up No.1 down No.2 up & down	11 5	12.5 20.5 20.5
19th	Hampstead Heath	Down		18
23rd	Camden Town	No.1 up No.1 down No.2 up No.2 down	7 1	14.5 20.5 20.5 20.5
25th	Haggerston	No.1 up & down No.2 up No.2 down	476 7 8	10 12 `12
November				
7th	Camden Town	Down	7	1
8th	Dalston Junc	No.1 up & down No.2 up & down	5	19 1.5
15th	West End Lane	Up		17.5
16th	Willesden	Up & down High Level goods. (Up & down City Goods		15.5 12.5
16th	Kensal Rise	Up & down		15.5
16th	Gospel Oak	Up & down		12

North London Section – Dalston to Poplar

1940 September	***Place***	**Lines Blocked**	**Days**	**Hours**
7th	Bow (Devons Road)	Up & down	1	2
9th	Homerton	Up & down		3.5
16th	Victoria Park	Up & down		13
18th	Bow	Up & down	3	5.5
10th	Old Ford	Up Down		11.5 10.5
23rd	Bow	Up & down		11
October				
13th	Dalston Junc.	Up & down	1	21
25th	Bow	Up & down	1	1.5
31st	Dalston Junc.	Up & down		15

North London Section - Hendon to St. Pancras.

1940 September	**Place**	**Lines Blocked**	**Days**	**Hours**
8th	St. Pancras	Up & down fast Up & down slow Up goods Down goods		21 21 9 6
20th	Hendon	Up & down slow		23.5
21st	Hendon	Up & down goods		8
26th	Cricklewood	Up & down fast Up & down slow Up & down goods No.2 up goods		2 2.5 2.5 9
27th	Cricklewood	Up fast Down fast Up slow Down slow Up goods	4 2 1 4 1	17 17.5 12.5 16 **12.5**
27th	Kentish Town	Up & down goods		19
28th	Kentish Town	Up & down fast Up & down slow Up & down goods		2.5 2.5 2.5
October				
2nd	Kentish Town	Up goods Down goods		3 2
3rd	Cricklewood	Down fast		1.5
5th	Hendon	Up fast Down fast Up & down goods		2.5 2 2
10th	Hendon	Up fast Down fast		13.5 17.5
10th	Kentish Town	Up & down slow Up goods Down goods		10.5 17.5 14
15th	Kentish Town (Kings Cross Tunnel)	Up & down	4	15.5
15th	Kentish Town	Up main Down main		5.5 1.5
15th	Kentish Town	Up main Down main		14 11.5
15th	Cricklewood	Up fast Down fast Up slow Down slow No.2 up goods		13 14.5 15.5 16.5 9.5
23rd	Kentish Town	Up & down fast		22

November				
7th	St. Pancras Station	Nos 1,2,& 3 Platform lines	3	9

North London Section - Kentish Town to Leyton

1940 September	Place	Lines Blocked	Days	Hours
10th	Junction Road	Up Down		12 15
14th	Kentish Town	Up & down		19
19th	Leyton	Up Down	 39	14 15.5
19th	Leyton	Up		8
16th	Kentish Town	Up	1	17.5
28th	Upper Holloway	Up & down		18
October				
2nd	Crouch Hill	Up & down		7
5th	Upper Holloway	Down		12.5
10th	Kentish Town	Up & down		10.5
10th	St. Anne's Road	Up & down		10.5
12th	Kentish Town	Up & down goods	21	15
19th	Upper Holloway	Up Down	2 5	16.5 14
22nd	Junction Road	Up & down	1	2.5
21st	Harringay Park	Up Down	2	16.5 12

North London Section – Acton Branch (Cricklewood to Acton).

1940 September	Place	Lines Blocked	Days	Hours
16th	Harlesden	Up & down	2	15.5
25th	Near Acton Wells Junc.	Up & down		4
27th	Acton Branch	Up Down	2 2	16 6.5
October				
4th	Acton Branch	Up & down		10
10th	Dudding Hill	Up Down	16	22.5 22

Appendix B – Lines blocked by enemy action – Birmingham, Coventry and Wolverhampton Area from August to November 1940.

Main line – Rugby to Wolverhampton

1940 September	Place	Lines Blocked	Days	Hours
12th	Coventry	Up & down		3
15th	Coventry	Down		6
16th	Birmingham (New St.)	Up & down		12
24th	Ditto	Up & down		18
25th	Birmingham (Curzon St.	Up & down		1
26th	Monument Lane	Up & down		11
26th	Birmingham (New St.)	Up & down		19.5
18th	Ditto	Up & down		3.5
November				
1st	ditto	Up & down		3
14th	Coventry	Up Down	1 1	11.5 20
14th	Brandon & Wolston	Up & down		13

14th	Coventry	Down	1	20
19th	Adderley Park	Up & down		21.5
19th	Birmingham (New St.)	Up & down		19.5
19th	Spon Lane	Up Down	241 39	21 12
19th	Winson Green	Up fast Down fast Up slow Down slow		17 7.5 11 18
22nd	Stechford	Up & down main		15.5
23rd	Marston Green	Up & down		2.5
23rd	Birmingham (New St.)	Up & down	8	23
23rd	Winson Green	Up & down		1

Birmingham to Wolverhampton via Aston or Soho Road and Bescot.

1940 September	Place	Lines Blocked	Days	Hours
17th	Aston	Up & down		4
19th	Birmingham (New St.)	Up Down		3.5 1.5
19th	Aston	Up & down		1
21st	Wittton	Up & down	1	17
November				
1st	Vauxhall	Up main Down main Up & down goods		10.5 14 3
19th	Vauxhall	Up & down main Up goods Down goods	 11 18	16 19.5 19.5
20th	Aston	Up Down		16.5 13.5
21st	Vauxhall	Up & down fast	20	12.5
22nd	Stechford	Up & down Aston		15.5
23rd	Vauxhall	Up & down fast Up & down slow	2 2	9 9

Other Sections of Line

1940 August	Place	Lines Blocked	Days	Hours
26th	Aston (Windsor St. Branch)	Down goods		4
27th	Cosford Green	Up goods Down goods		12.5 19
27th	Between Foleshill and Coundon Road	Up Down		4 5.5
October				
12th	Coventry (Leamington Branch)	Single		5
12th	Foleshill	Up & down	2	13
12th	Coventry	Up & down branch		3
15th	Wylde Green	Up Down		17 18.5
21st	Bell green	Up goods Down goods		12 15.5
25th	Wednesbury	Down Princes End Branch		1.5 1.5
25th	Gravelly Hill	Up & down		2
29th	Foleshill	Up & down		1.5
November				
14th	Foleshill (south of station)	Up & down	10	6.5
14th	Foleshill (north of station)	Up & down	3	10
14th	Coundon Road	Up & down	12	17.5
14th	Coventry	Up Leamington Down Leamington	1 2	19 11

14th	Bell Green	Up & down goods	7	10.5
20th	Gravelly Hill	Up & down		13.5

Main Line - Derby to Gloucester

1940 August	Place	Lines Blocked	Days	Hours
24th	Castle Bromwich	Up goods Down goods		6 5.5
25th	Castle Bromwich	Up & down main		1
October				
16th	Birmingham	Up & down		12
17th	Saltley	Up main Down main	4 5	16.5 17
24th	Birmingham (New St)	Up & down		5
25th	Ditto	Up & down		1
26th	Ditto	Up & down		5.5
26th	Somerset Road	Up & down		1.5
28th	Birmingham (New St.	Up & down		6
November				
1st	Ditto	Up & down		3
19th	Ditto	Up & down		18.5
23rd	Ditto	Up & down		16
23rd	Saltley	Up main		13.5
23rd	Coleshill	Up & down		7.5
22nd	Birmingham (New St.)	Up & down		15.5
23rd	Selly Oak	Up & down		10.5

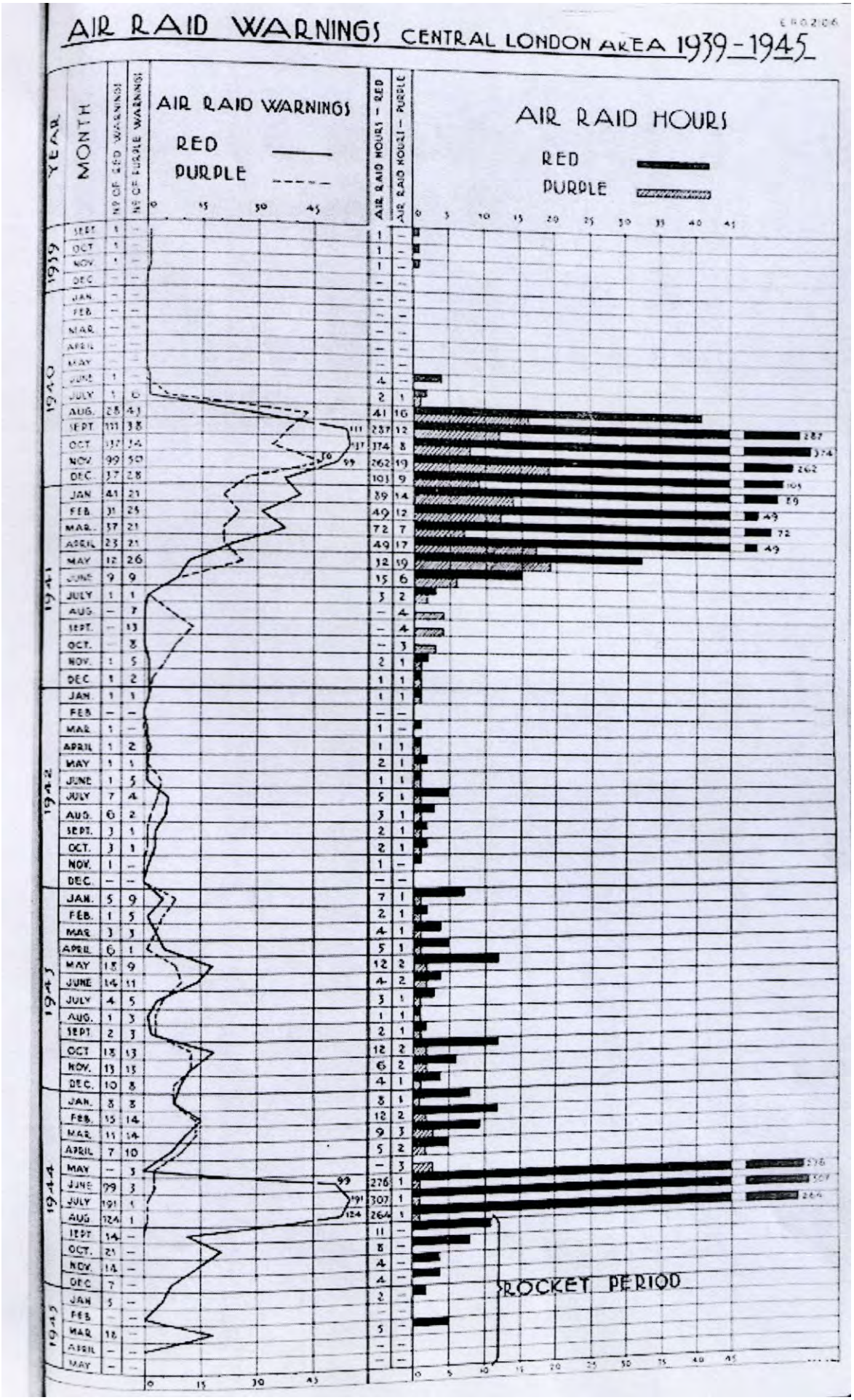
Birmingham Avoiding Line via Kings Heath.

1940 August	Place	Lines Blocked	Days	Hours
27th	Camp Hill	Up Down		10.5 12
October				
15th	Brighton Road	Up Down		9 16
17th	Saltley	Up Camp Hill	9	18
18th	Camp Hill	Up & down		2.5
27th	Kings Heath	Up & down		0.5
November				
23rd	Saltley	Up & Down Camp Hill		13.5
23rd	Kings heath	Up Camp Hill Down Camphill	 1	13.5 15

Line Blockages by Enemy Action 1939 to 1945.

	1929	1940	1941	1942	1943	1944	1945	Total
No. of occasions damage was caused	**Nil**	**1,140**	**576**	**70**	**24**	**224**	**29**	**2,063**
No. of occasions running lines were obstructed	**Nil**	**447**	**204**	**26**	**5**	**35**	**8**	**725**
No. of hours lines were blocked	**Nil**	**43,999**	92,133?	**6,497**	**99**	**638**	**98**	**143,464**

Appendix C. Air Raid Warnings – Central London Area 1939 to 1945.



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This monologue belongs to a series produced by members of the LMS Society to provide a background to the activities and achievements of the LMS Railway during its existence from 1st January 1923 to 31st December 1947

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