



# BRITISH RAILWAYS

IN PEACE AND WAR

FULLY ILLUSTRATED

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1944







# **British Railways in peace and war**

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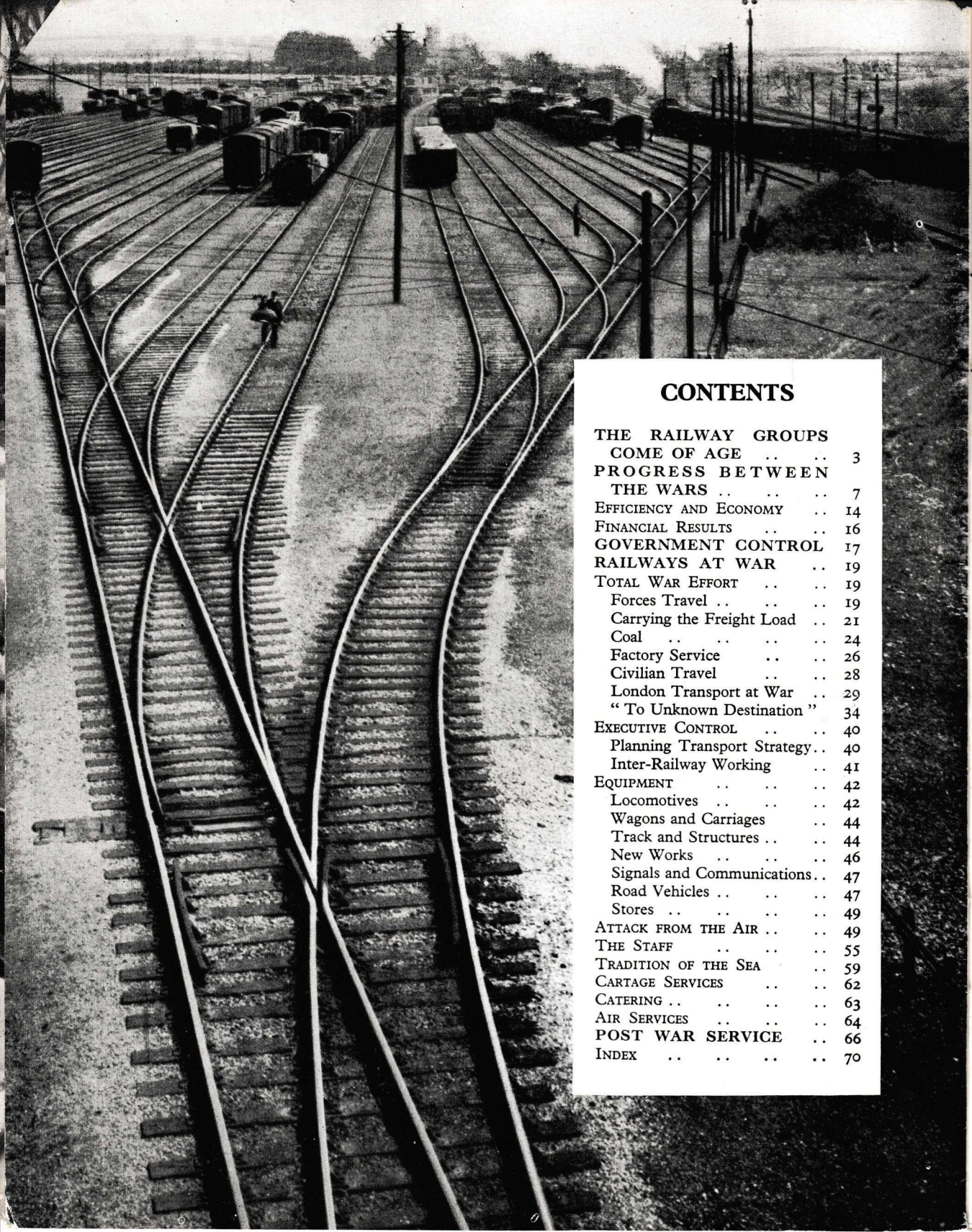
Waterloo Station, London, S.E.1

on behalf of

**GWR LMS LNER SR and**

**London Transport**





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# THE RAILWAY GROUPS COME OF AGE

This booklet is designed to give to the public a brief account of the work of the British railways in the fifth year of the war. But, the war apart, 1944 is an important year in railway history, for it marks the coming of age of the four main line railway companies. They were "born" on January 1, 1923, as the result of an Act of Parliament which created a peaceful revolution in the railway industry.

There are, of course, many who can still look back on the achievements of the various railways long before they became the present groups; they can remember the great part the railways took in the last war when, as the Royal Commission on Transport of 1931 reported, they "bore the brunt of the transport burden and successfully responded to the constant calls made upon them." But most people to-day, when they think of the railways, think of Great Western, London & North Eastern, London Midland & Scottish and Southern. These names have become household words, and perhaps, as an introduction to this booklet, it may be of interest, on this special occasion, to dwell for a moment on the origin of the four groups.

## Amalgamation

Many railwaymen, and probably a lot of other people, recall the tremendous controversies which preceded the formation of the four main line railways in 1923. Between 1914 and 1921 the railways were under Government control. Just as now, when there is considerable discussion as to the future of transport after the present war is over, so then there were differences of view as to what should be done. There were three main points of view. The first was that the railways should be returned to private enter-

prise; the second was that they should be nationalised; and the third lay between these two and was that private enterprise should be reverted to with a new system of statutory regulation. It is of interest to note that our present great leader and Prime Minister, Mr. Churchill, when a member of the War Cabinet in 1918, made a speech at Dundee and replied to a question on the railway problem in terms which were read as favouring nationalisation. Whether that was then the policy of the Government was never made public, but in 1919 the Government established the Ministry of Transport, and in the next two years considered what the future policy should be. Sir Eric Geddes—the first Minister of Transport—stated in April, 1920, that it would be better to give the railways the amalgamations which many of them had sought, but which hitherto had been refused because of the fear that they would be used to oppress the districts served. He added, however, that a means would be provided "to prevent a local monopoly being used oppressively." When, two months later, Sir Eric issued a White Paper containing the Government's proposals, it was found that all the 120 railways were to be compulsorily amalgamated into groups and with a new restriction of profits. In 1921, when the Bill was introduced into Parliament, provisions were included for an onerous control of charges. Presumably these were the steps Sir Eric had in mind, "to prevent a local monopoly being used oppressively."

In recalling Mr. Churchill's statement in 1918 on nationalisation, it is interesting to record his words in the coal debate in the House of Commons on October 13, 1943—25 years after: "I advocated nationalisation of the railways after the last war, but I am bound to





*Railways—an asset of national importance*

say that I was a bit affected by the experience of the national control of the railways after the war, which led to the public getting a very bad service, to the shareholders having very unsatisfactory returns, and to one of the most vicious and hazardous strikes with which I have ever been concerned."

**The Railways Act, 1921**

The Railways Bill of 1921 became law on August 19. It ordered the amalgamation into four undertakings of the whole of the railways in Great Britain other than the London passenger lines not owned by the main line companies and certain jointly-owned and light railways. The Act created a special Tribunal, which was vested with

full powers to approve satisfactory schemes of amalgamation agreed between the parties to each group, and to amalgamate compulsorily where such agreement was not reached. In most cases the companies came to agreements which satisfied the Tribunal, and were accordingly ratified. Only in one case of importance—that of the Caledonian Railway—was there ultimately a difference of opinion necessitating the formation of a scheme of amalgamation by the Tribunal, and from January 1, 1923, the four groups were created by Orders of the Tribunal, which had the force of Acts of Parliament, and took over the properties of 120 old companies mainly in consideration for stocks of the new companies, though in a few minor



cases cash payments were made. Thus, with very little trouble, capital assets representing over £1,000 millions were transferred to the new groups, and in the course of amalgamation, the nominal capital of the railways concerned was reduced by £150 millions, the number of securities being reduced by over 500.

### **Unity of Ownership**

Thus the four main line companies, as we know them to-day, came into being. The Act of 1921 did not attempt to indicate what each group should do to effect more than mere unity of ownership, beyond a general condition of efficiency and economy in working and management in settling the levels of rates and fares. Amalgamation of ownership handed over to each new company a number of distinct entities, each with traditions, practices and methods which, while presenting little difference to the public, were often radically at variance.

Such visible things as locomotive and vehicle design, signalling, or brake types are obvious matters which required attention, but were hardly as important as the need to create a new and unified system of administration. Fusion could not perpetuate all the varying traditions of the staffs of the old companies, and naturally disturbed those who had long experience of them and knowledge of their history.

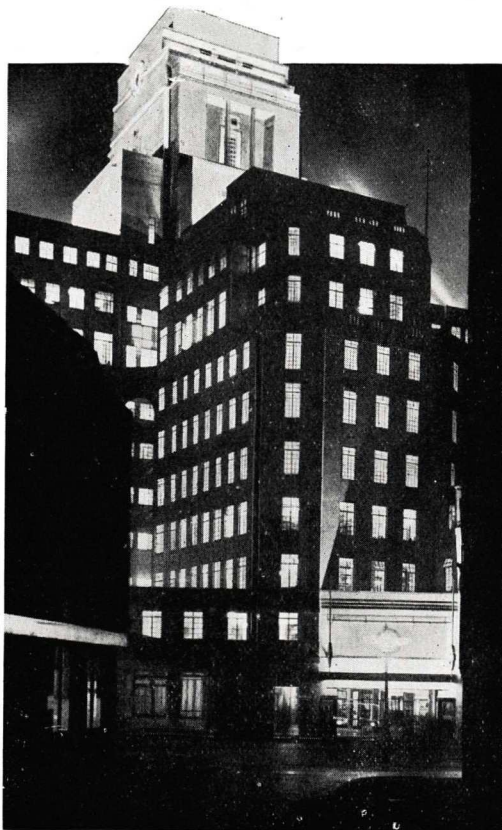
While this change was taking place, it must be remembered that the day-to-day business of the companies had to be carried on; the ravages of wartime postponement of work had to be overcome, and the new requirements of the Railways Act for rate-charging purposes had to be met. Further, the years following amalgamation were years of great economic disturbance, with their attendant effects on the trade of the country; and immediately before amalgamation and since, railway transport, bound at almost every point by public regulation, was subject to rapidly developing road competition.

It is in the light of these circumstances that the achievements of the railways, as briefly recorded in later pages, must be considered. Whatever the verdict of readers may be, we feel sure they will not begrudge the pardonable pride of the railway companies in the services they have rendered the public over the past 21 years.

At the end of the booklet there is an outline of some of the matters to which the railways are giving their attention for development when the war is over. The next 21 years of their history will be momentous, and they will strive to serve the public and the nation no less than in the past.

### **London Transport**

This booklet is not only concerned with the main line railways, but also with the London

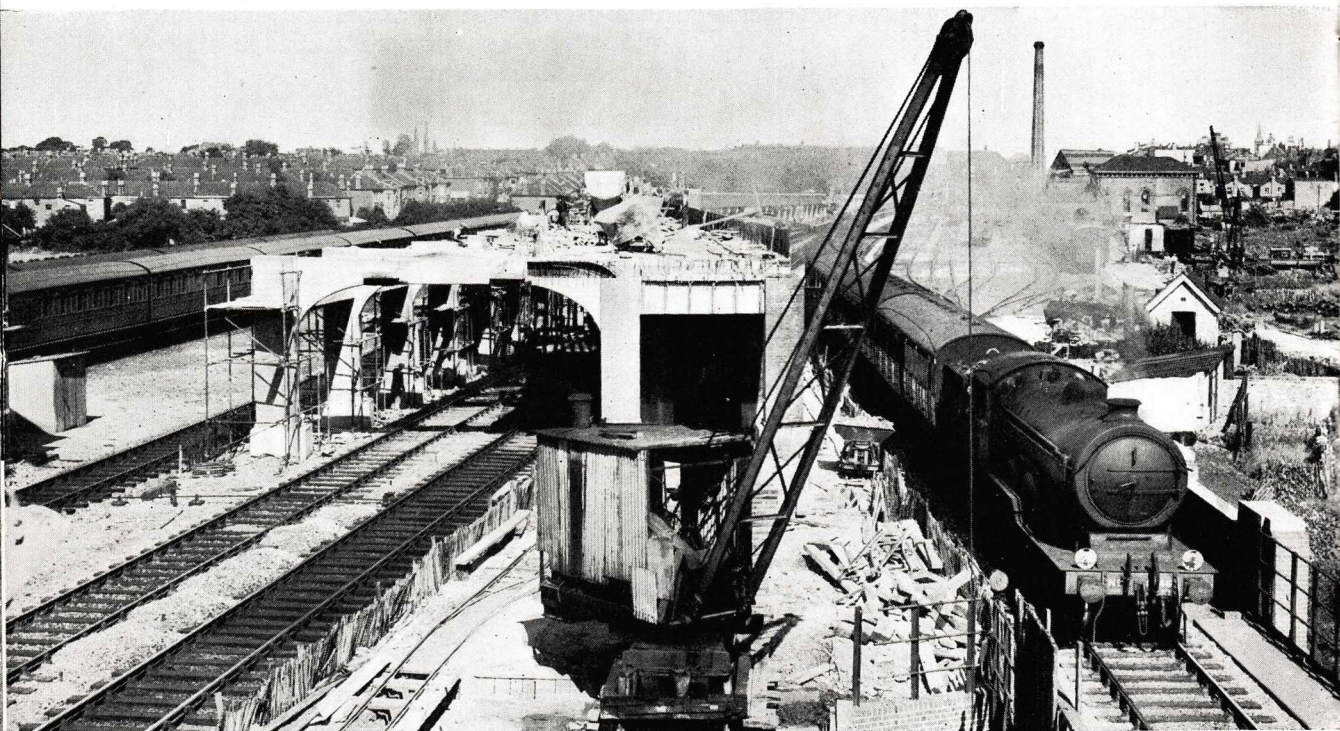


*H.Q. London Transport*



Passenger Transport Board. On July 1, 1933, London Transport was 10 years old. On the morning of July 1, 1933, buses, trams, trolleybuses and underground trains ran as usual and wore their accustomed liveries, but the familiar "London General Omnibus Company," "London County Council," etc., were replaced by a new name and address—"London Passenger Transport Board, 55, Broadway, S.W.1." This dramatic change was made within the short space of five hours on a single night; many hundreds of men

Under the London Passenger Transport Act of 1933, the Board was charged with the responsibility for providing an adequate and properly co-ordinated system of passenger transport within the London Passenger Transport area, and for this purpose was required to take such steps as it considered necessary, in conjunction with the main line companies, for extending and improving transport facilities so as to meet the growing needs of a population then numbering 9,400,000 people. The task was great. In an area within a



*Improvements to assist working*

were employed to alter the wording on 8,000 road vehicles. Within a short time the ownership of 162 undertakings, including five railways, 17 tramways, 136 bus and coach undertakings and four subsidiary companies became vested in the Board. So came into being the greatest urban transport system in the world.

radius of some 25 miles of Charing Cross, 3,200 railway cars, 2,600 trams and trolleybuses, and a fleet of 6,000 buses and coaches ran 537,000,000 miles a year, and carried 3,617,000,000 passengers, or nearly 10,000,000 a day. The Board was planned to co-ordinate this vast movement and operate it as a complete entity for the public benefit.



It also had to fix such fares as would enable it to pay its expenses out of its revenue. In addition, the Act forming the Board created a community of interest between it and the four main line railway companies for all passenger traffic in the London area other than through traffic to and from the rest of the country. The passenger receipts of the Board and the

railways in this great area, after deduction of operating allowances, were pooled and divided in fixed proportions subject to additions for new capital outlay agreed by the five parties. In the last year before the war the total gross receipts so pooled amounted to £42 millions. We shall see later that its obligations to the travelling public were discharged in full.

## PROGRESS BETWEEN THE WARS

With the outbreak of war in 1939 the main line railways were able to place at the country's disposal an asset of supreme national and strategic importance. Of them it could truly be said—*they were ready*; ready for the greatest test that could be made of any undertaking, under the most arduous conditions and, as events have shown, of a duration that called for long and sustained effort.

That the railways have been able to stand up to that test is no chance matter. They have been through the fire before, not, it is true, the ordeal of battle, but they have in the uneasy years between the wars faced successively a major re-organisation of their industry; a battle on unequal terms against acute road competition and a period of trade depression of unprecedented severity.

Throughout this period the railways, privately owned and managed by private enterprise, had, with what was surely great courage and foresight, pursued a steady and progressive policy of improvement, to which war alone called a halt. It was this policy, carried out in the face of great difficulties, which alone made it possible for the railways to meet the rail transport requirements necessary to Great Britain and her Allies for the successful prosecution of the war.

The programme of new works and reconstructions which the main line railways carried out between 1923 and 1938 was indeed a staggering one. It involved, together with the schemes carried out up to

the end of 1942, an expenditure of no less than £450,000,000. The two main items of outlay in this total were £170,000,000 on rolling stock and nearly £100,000,000 on permanent way.

It enabled the railways to increase the capacity and efficiency of their plant and equipment; it made possible improved methods in operation and in organisation; it gave the staff better and more efficient tools to work with. Its total effect was materially to improve the facilities for all kinds of railway users and at the same time it assisted in securing the same, or better service, at less working costs. Much of the work, carried out at a time of great trade depression, gave welcome orders to manufacturers throughout the country and created employment at a time when it was most needed.

The works carried out are too numerous to mention in detail. They include new locomotives and trains, new and modernised stations, goods depots and warehouses, renewing, doubling and quadrupling of tracks, the building of fly-over junctions, new sidings and marshalling yards, schemes of electrification, new locomotive depots and plant, new hotels and new steamships and docks.

The £170,000,000 spent on rolling stock produced new trains of a standard of comfort that would bear world comparison: the advance in design of third-class carriages was particularly notable. The number of sleeping cars increased from 154 in 1923 to 380 in 1938, and third-class sleepers were



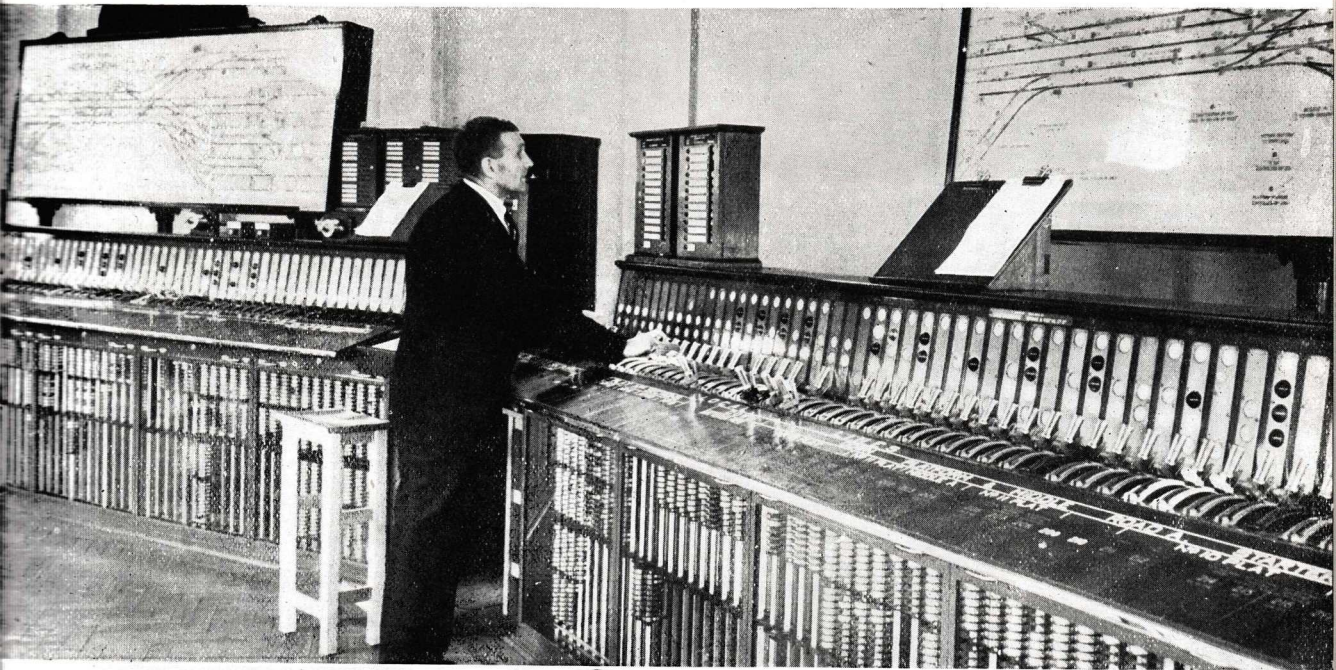
*New and modernised stations*



*A new standard of comfort*



*More efficient equipment*



*23,000 miles of track renewed*



put into service in 1928. The number of restaurant cars rose from 516 to 773, and the meals served in them annually from 5,300,000 to 8,100,000. Separate kitchen cars were introduced with electric cooking and refrigeration.

Throughout these years the standard of speed, cheapness and comfort for passenger travel became progressively higher and higher. By 1938 Britain could boast the fastest and most intensive passenger train service in the world. A wide extension of cheap fare facilities, particularly the introduction in 1934 of "penny-a-mile" tickets, and the development of day, half-day and evening excursions, made it possible for a large majority of rail passengers to travel at fares less than the ordinary rate. Whereas, in 1923, 416,800,000 journeys were made at ordinary fares, only 68,900,000 were made in 1938; while the journeys made at cheaper rates rose from 209,600,000 to 492,400,000. Overall, the number of passenger journeys was reduced by 13 per cent.; this reduction, however, occurred mainly in short-distance journeys, and there was an increase in long-distance journeys. The net result was that in 1938 the total passenger travel by railway increased by 3 per cent. over 1923.

The miles run by loaded passenger trains during the 16 years increased from 216,000,000 to 273,000,000, or by 26 per cent.

Cheap rates were available for all kinds and conditions of people—for blind ex-servicemen and anglers; for choirs, campanologists and concert parties; for players of games and watchers of games; for ships' crews and parties of whalers; for delegates to conferences and for commercial-travellers going home for the week-end, and various others.

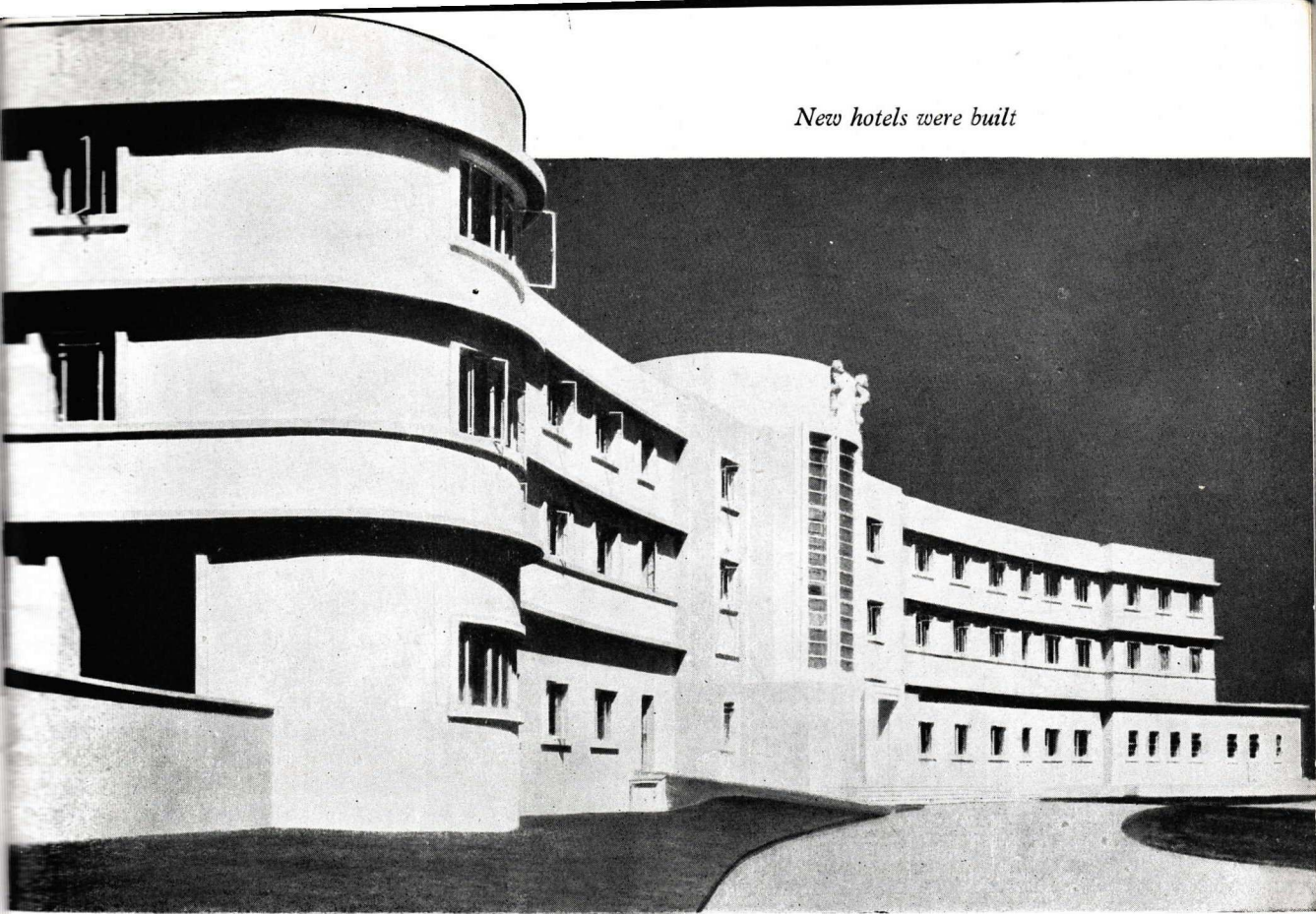
On the freight side, progress was no less marked. Many new types of vehicles were designed to cater for all kinds of traffics. Over 45,000 high capacity vehicles, capable of taking loads of 20 tons or more, were in

service in 1938. Door-to-door containers for general merchandise were introduced in 1927 and by 1938 a total of 15,500 in many varieties were in service. New vacuum-braked freight trains, travelling at high speeds, increased the volume of "next-day" deliveries; by 1938, 678 regular freight trains each 24 hours provided this service, in some cases to places as far as 300 miles apart. Among other new services were demountable tanks for the conveyance of liquids in bulk, new and extended refrigeration methods, vans for perishable traffic and shock-absorbing wagons. The combined effort of commercial and technical research was directed to the achievement of an ever extending and improving freight service.

Fast locomotives of new design were built to haul the new high-speed passenger trains; some of them were streamlined. The L.N.E.R. engine, "Mallard," holds the world's record for steam traction with a speed of 125 m.p.h. Despite the relatively short distances in this country, British railways have consistently had a large number of trains running at average start-to-stop speeds of 60 or more miles per hour. In 1938 there were over 100 of them. Heavy freight locomotives have been developed with enormous pulling power. The efficiency of the modern locomotive can be judged from the fact that the miles run per steam locomotive per annum increased from 22,512 in 1923 to 27,210 in 1938, or by 21 per cent. Practically the same locomotive mileage was run in 1938 as in 1923, but the number of locomotives used was reduced by 4,300.

High-speed services demand a first-class track. Developments in the design of track and components and in maintenance methods systematically pursued between 1923 and 1938, made high-speed services possible with the maximum of comfort to passengers. By 1938 track maintenance had indeed become a more exact science than ever before. Between 1923 and 1942 some 23,000 miles of track were completely renewed. New methods of





aligning junctions enabled trains to pass over them by 30 to 40 miles faster per hour. A new method of packing sleepers—measured shovel packing—helped to create a new high standard in track perfection. Bridges and viaducts were strengthened and rebuilt to take heavier loads; one railway carried out 1,158 such schemes between 1923 and 1938.

In the search for higher standards of track maintenance experiments were continually being made with new devices and new methods. Among them was the use of steel keys, which require much less re-driving than timber and prevent rail “creep”; the testing of steel sleepers in main line track; new experiments with fiat-bottomed rails; continuous welded track to give smoother running and the use of two-hole fishplates to give closer spacing of sleepers at rail joints.

The introduction of colour light signalling, the extension of track circuiting and the provision of systems of automatic train control assisted considerably in operating high-speed and intensive services. Additional telephone circuits improved communications and gave greater flexibility in control.

Three hundred and fifty new stations and 40 new goods depots were built between 1923 and 1938. New branch and loop lines, new sidings and marshalling yards were constructed and tracks were doubled and quadrupled. The increased capacity which these works provided enabled the railways to handle traffic with greater speed and efficiency. Many locomotive depots and layouts were completely modernised and new equipment—coaling and ash-lifting plants and power-operated turntables—was installed.





*More trains at peak hours*

During this period between the wars the railways sought, in every conceivable way, to make their service extend from door-to-door. The number of road motor vehicles increased from 2,087 to 10,367, partly, it is true, due to the substitution of motors for horse-drawn vehicles, but chiefly to afford more expeditious transit in conjunction with rail services. The road-rail container naturally played a big part in making the wide extension of door-to-door service possible, as also did the introduction of country lorry services and railhead distribution schemes. Throughout road transport services were operated wherever they could give better service. On the passenger side, the financial interests which the railways acquired in many passenger road undertakings, enabled rail and road services to be dovetailed together.

All the 53 railway-owned hotels were modernised and six new hotels were opened between the years 1923 and 1938. The

railways are indeed the only organisation which owns a complete chain of large first-class hotels in this country; they are the largest hotel owners in the world. Resort hotels provide accommodation for tourists and were patronised largely by visitors from overseas. In provincial cities and towns, railway hotels have provided central points for the business and social needs of the communities they serve.

The railways' steamer fleets, which provide the principal means of communication between Great Britain and the Continent, Northern Ireland and Eire; the Channel Isles; and the Western Isles of Scotland, were completely modernised. New vessels, such as motor carriers and train ferries, were built to cater for special traffics. In all, some £7,000,000 was expended on steamship developments. At the docks up-to-date mechanical equipment for unloading and loading direct from ship to truck, and *vice versa*, was installed. Floating cranes and



floating grain elevators were introduced, together with the latest type of warehouse equipment such as conveyors, electric trolleys, etc. In 1933 the world's largest graving dock was opened at Southampton.

#### **A £40,000,000 Programme for London**

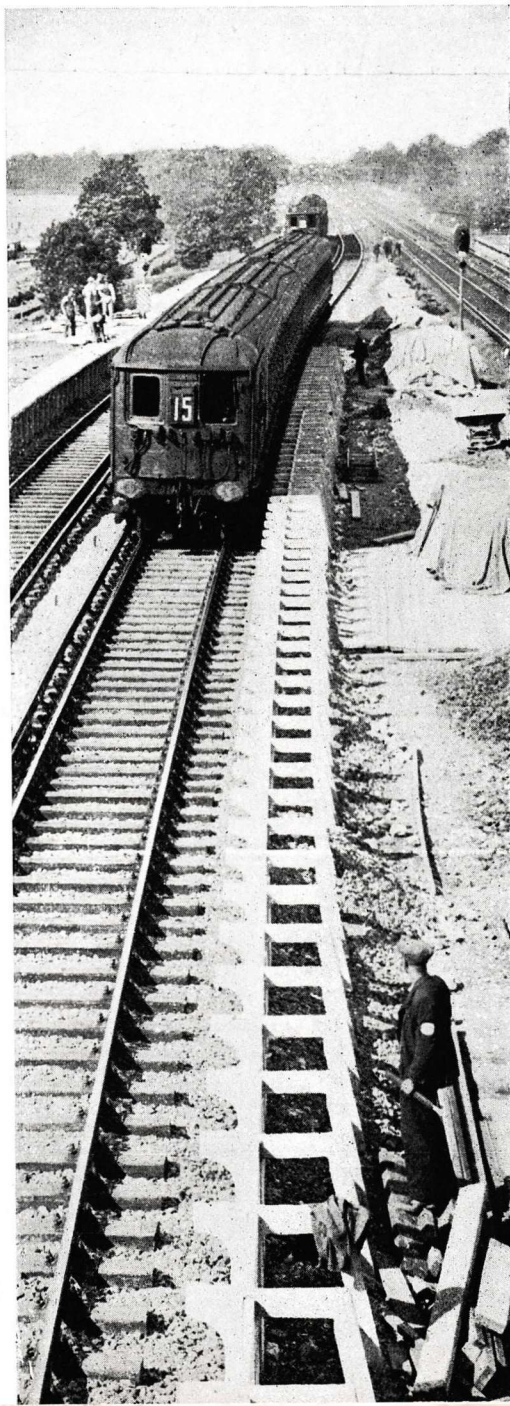
In London the public did not have long to wait for tangible proof of the wisdom of co-ordinating transport. Immediate steps were taken to hasten the completion of improvements embarked upon by the former Underground group of companies, including the extension of the Piccadilly Line to Cockfosters, the re-construction of Leicester Square, Holborn, Knightsbridge, Monument, and other important Underground stations.

A £40,000,000 five-year programme, undertaken in conjunction with the main line railways, and with the support of the Government, was in full swing when war broke out. Improvements completed included the Northern Line extension from Highgate Archway to Finchley and High Barnet, with a branch to Mill Hill East and, on the Bakerloo and Metropolitan lines, a new tube between Baker Street and Finchley Road stations to enable trains to run to Stanmore and give North West Middlesex direct service to the West End. The five-year programme provided for new rolling stock for the railway extensions, the modernisation of power stations and the conversion of tram routes to trolley-bus operation.

Although, perhaps, the most progressive of the plans have been the extensions of underground railways to link up with the suburban lines of the main line railways, there have been many other improvements. Road services, particularly in the outer areas, were replanned and extended, and some 33,000 buses and coaches were replaced by modern and more efficient vehicles. On the railways escalators replaced lifts, and faster ones replaced the slower models. A new tube car increased seating capacity in a 7-car train by 15 per cent. Acceleration and

braking were improved so that more trains could be run during the peak hours. Rapid ticket-issuing machines speeded up booking.

#### *More lines electrified*





## EFFICIENCY AND ECONOMY

In carrying out their considerable programme of improvements, the railways sought to exercise true economy. By that is meant reductions in cost by finding a better way of rendering the same, or improved, service as distinct from variations in prices of labour and material.

This search for true economy has in one direction required a rigorous cutting out of "dead wood"—reductions of capital from such operations total £23,000,000 for the 1923-42 period, apart from capital replacements—and in the other, ingenuity in finding new and improved methods of working and organisation; inventiveness in improving

existing equipment and in devising new, and readiness in each and every department to co-operate in achieving a unity of purpose.

In giving effect to this policy, the railways have worked in the closest co-operation. The economies which one railway has been able, by research and experiment, to perfect, were readily passed to others, so that all rail transport users might benefit. The campaign has been aided by all the resources of technical skill and scientific research. Equipment produced to meet railway requirements has often found useful employment in wide industrial fields outside the railways. The "mechanical horse," for instance, first produced in co-

*50,000 miles of track*







*Increased capacity in marshalling yards*

operation with railway technicians, is now used by road transport operators all over the country.

Between 1923 and 1938 expenditure on permanent way and works was reduced by 12 per cent., partly due to the economies which were effected and partly due to reductions in prices.

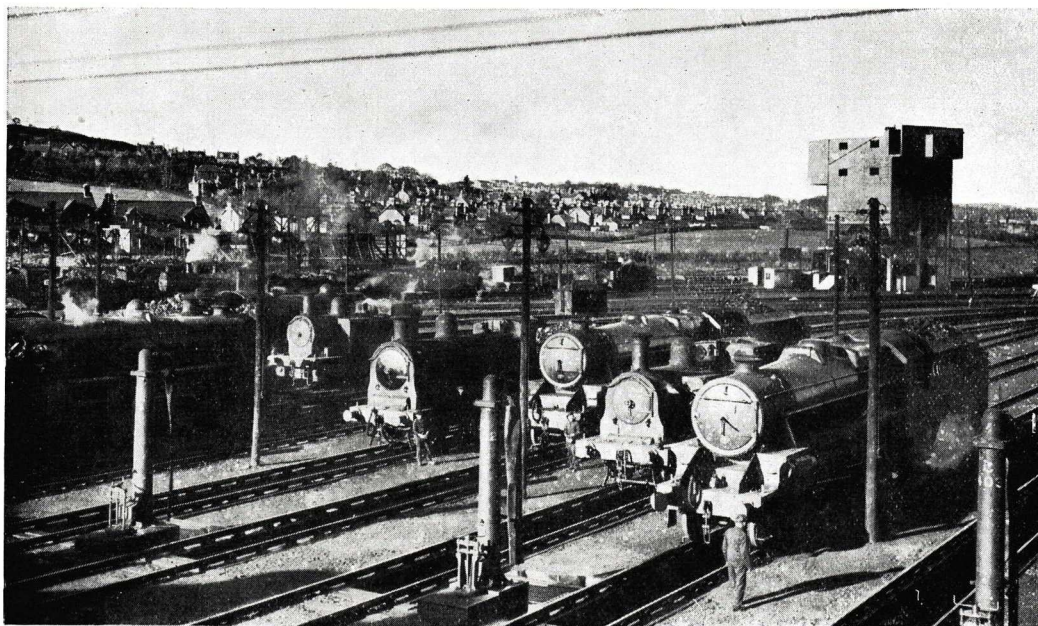
The decrease in expenditure on maintenance of rolling stock was about 15 per cent. despite a 5 per cent. increase in the miles run by engines. This also was partly due to reduced prices. Operating expenditure shows nearly the same improvement as for rolling stock. In 1938 engines used less coal by 2.4 lbs. per mile which equalled 570,000 tons and averted a further outlay of £500,000. Handling costs per ton of freight, despite a substantial increase in the number of consign-

ments and higher wages per ton, were slightly reduced.

### **Tribunal's Tribute**

The Railway Rates Tribunal, created by the Railways Act, 1921, is in normal times the ultimate authority for fixing the price of transport by rail, and is charged with the duty of adjusting charges to revenue. For this purpose the Tribunal holds annual investigations into railway results and one of the most important matters on which it has to pronounce is whether the railways have been conducted with efficiency and economy. Every year since the Act came into force the Tribunal, after having access to every detail relating to railway operations and after examining railway representatives in public enquiries, has declared itself satisfied that there has been no lack of efficiency or economy in the management of the railways.





*Locomotive depots were modernised*

## FINANCIAL RESULTS

The total main line railway receipts fell from £195.6 millions in 1923 to £159.7 millions in 1938, or by 18 per cent. The largest decreases were in passengers and the higher classes of merchandise. The wartime traffics have brought up passenger train receipts to about 45 per cent. and goods train receipts to about 60 per cent. above those of 1923. On the other hand, between 1923 and 1938 railway expenditure was reduced from £156.9 to £133.8 millions, or by 15 per cent. The net revenue totalled £45.6 millions in 1923, whereas in 1938 it was only £29.0 millions.

It is of interest to compare these net revenue results with the modest net revenue which Parliament considers the railways require to earn to enable them to provide a reasonable return on the capital and allow for development. This amount is £51.4 millions, or a return of 4.7 per cent. on the capital receipts of the undertakings. The actual return since 1923 has been :—

	Per cent.		Per cent.
1923	.. 4.4	1933	.. 2.8
1924	.. 4.0	1934	.. 3.1
1925	.. 3.6	1935	.. 3.1
1926	.. 1.9	1936	.. 3.3
1927	.. 4.0	1937	.. 3.5
1928	.. 3.8	1938	.. 2.6
1929	.. 4.2	1939	.. 3.4
1930	.. 3.5	1940	.. 3.5
1931	.. 3.2	1941	.. 3.6
1932	.. 2.6	1942	.. 3.6

### Stockholders

The total number of main line railway stockholders is 848,000, but if the number of persons interested in the holdings of railway stocks in the names of insurance companies, building and friendly societies, etc., were added, this would be very much increased. The capital invested in the railways is thus held to a large extent by, or on behalf of, small investors.



# GOVERNMENT CONTROL

On September 1, 1939, the Government took control of the main line railways, London Transport and other railways. This was done by the issue of an Order under the Emergency Powers (Defence) Act, 1939, on behalf of the Minister of Transport. By this Order the activities of the railways were immediately transferred from peacetime to wartime conditions.

The Railway Executive Committee, appointed by the Minister to be his agents for the purpose of giving directions under the Order, has been in regular session.

The undertakings taken control of were :—

- Southern Railway
- Great Western Railway
- London Midland & Scottish Railway
- London & North Eastern Railway
- London Passenger Transport Board
- Any Joint Committee of any two or more of the above
- East Kent Light Railway
- Kent and East Sussex Light Railway
- King's Lynn Docks and Railway
- Mersey Railway
- Shropshire and Montgomeryshire Light Railway
- Shropshire Railways

The Control Order continues in force for a minimum period of one year after the cessation of hostilities. Before control comes to an end (i.e., before all statutory rights and obligations as they exist at that time again apply to the controlled undertakings) time will be given for the operation of any statutory machinery governing the level of railway charges.

## Financial Agreement

The financial arrangements between the Government, the main line railway companies and the London Passenger Transport Board,

arising out of the control exercised by the Minister of War Transport provide for fixed annual payments being made to the four main line railways and London Transport :—

	£
Great Western Railway.. ..	6,670,603
London & North Eastern Rly...	10,136,355
London Midland & Scottish Rly.	14,749,698
Southern Railway .. ..	6,607,639
London Passenger Transport Bd.	4,835,705
	<hr/>
	£43,000,000

The net revenues of the undertakings accrue to the Government except those from investments in transport undertakings not operated by the railways, and from railways in Ireland. In 1941 such net revenues accruing to the Government totalled £65.1 millions and in 1942 £89.1 millions ; thus after deducting the £43 millions paid to the railways and L.P.T.B., together with a further half million to minor controlled railways, the amount accruing to the Government in 1941 was £21.6 millions and in 1942 £45.6 millions.

The cost of restoring war damage is not charged to the net revenue accruing to the Government. War damage suffered by the controlled undertakings will be dealt with under the scheme established by the Government relating to public utility undertakings. The contributions falling upon the controlled undertakings under this scheme are borne by them out of their own resources.

Under the provisions of the control agreement, maintenance charges (including renewals) are standardised on the basis of the average pre-war charge adjusted for variations in assets and in price levels, subject to later consideration of the effect of abnormal use of the fixed and movable equipment under the conditions during control compared with those in the base years.







# RAILWAYS AT WAR

## TOTAL WAR EFFORT

To endeavour to tabulate in full the railways' war-time task is to attempt the impossible. Figures, though eloquent, give but the bare bones of the story, but because they offer the only means by which effort can be measured they must be used. One might say that a particular aircraft dropped 4 tons of bombs on Hamburg, and that truly is the measure of the result. Such a statement would, however, leave out a hundred and one factors which made that effort possible—the skill of the crew in navigation and in combatting weather and enemy action; the energy and efficiency of the men and women who make and maintain the aircraft and of those who make the ammunition and bombs; the competence of those who co-ordinate and plan the attack, and so on.

And so it is with the railways. Their effort cannot be measured only by the total work performed, but regard must be had to the conditions under which it is being undertaken, and the factors that make the successful fulfilment of the work possible.

Since the start of the war the miles run by trains operated by main line railways reached, by the end of 1942, the astronomic figure of 1,265 millions. In performing this task, engines ran 1,870 million miles.

Main line railway passenger travel in 1942 totalled 30,000 million miles, an increase of 50 per cent. on pre-war. At the same time there was a reduction of 28 per cent. in the mileage run by passenger trains: thus the loading of the trains more than doubled. The records for 1943 reveal that still more people are travelling.

Figures for the fourth year of war compared with 1938 demonstrate the enormous increase in the movement of freight over the railways. During this period the miles run by loaded

freight wagons, which best show the productive freight operating work done, totalled 3,980 millions or 32 per cent. over the last year before the war.

All this additional traffic has meant that locomotives have had to do much more work than in peace-time. They spend in a year 7,000,000 (or 11 per cent.) more hours in traffic, while the number available for actual work had, up to the end of 1942, increased by less than 1 per cent.

Vast Allied armies are assembling in Britain; armies that will soon surge into the attack. Already truck loads of bombs and train loads of petrol tanks, in ever increasing quantities, are streaming to the airfields for the great round-the-clock bomber offensive. Wherever and whenever the great attack is launched, the railways will be called upon for a tremendous, intensive effort, surpassing anything that has gone before. When that moment comes they will be ready, ready to play their part in storming the fortress of Europe.

### FORCES TRAVEL

In a recent month members of the Forces and their dependants made 16 million journeys on British railways, a figure that is 58 per cent. higher than in the same month a year before. Special trains run for personnel and stores now total over 200,000. In one recent week a record number of 2,655 such trains was run.

The first Empire troops arrived in this country in December, 1939. Since then Dominion, Colonial and later American troops have poured into the country. Thousands of special trains have been run to take them from the ports to camps.

Right from the day when mobilisation was ordered—one railway ran 164 special trains





*The constant coming and going of troops*

over 24 days for this—troops have been moving about the railways. Here is a selection of the jobs railways have been called upon to perform :—

40,000 men called to the Forces assembled at main line stations and were distributed to selected centres in 3 days.

The B.E.F. moving to ports of embarkation involved one railway in running 1,100 special trains for 390,000 personnel besides numbers of stores and ammunition trains.

Leave trains for the B.E.F. totalled 1,429 ; they conveyed 421,020 troops.

The Norway expedition needed 202 special trains run by one railway alone.

For 319,116 troops evacuated from Dunkirk, 620 special trains were run in 16

days. On one day 110 specials were run. Later evacuations from the Continent involved running another 200 trains.

Movement of troops to " Invasion " stations in the spring of 1941 required one railway to run 116 special trains spread over twenty-seven days.

First exports to Russia involved one railway in running 132 special trains between August and November, 1941. Similar despatches have subsequently been made at fairly frequent intervals.

These, and the despatch of armies overseas, which is referred to in detail in a special chapter, are the " high-spots " of the railways' work in connection with troop movements. There is, in addition, the constant coming and going of troops on leave, on large scale





*"The Gentle Sex" travel by train*

exercises, on training courses, on re-postings ; the movement of trainloads of armoured fighting vehicles and the continuous flow of troops, stores, guns and equipment to the ports to reinforce our armies overseas.

Any member of H.M. Forces, of the Dominions, Colonial and Allied Forces serving in Britain, their wives and dependent children under 16, can travel on leave at half-fare, as also can members of the Women's Auxiliary Services and of the Mercantile Marine going home from their ships and returning to them. Their wives and children get similar treatment when they visit "Daddy" at the port or other station.

Personnel of H.M. and Allied Forces and the Mercantile Marine on leave in London, can get a shilling ticket which gives them the

freedom for one day from 10.30 a.m. of London Transport's central bus, tram and trolleybus services and most of the Underground. In 1941, the first full year, 216,000 took tickets ; in 1943 over 435,000 had taken advantage of the scheme up to the end of July.

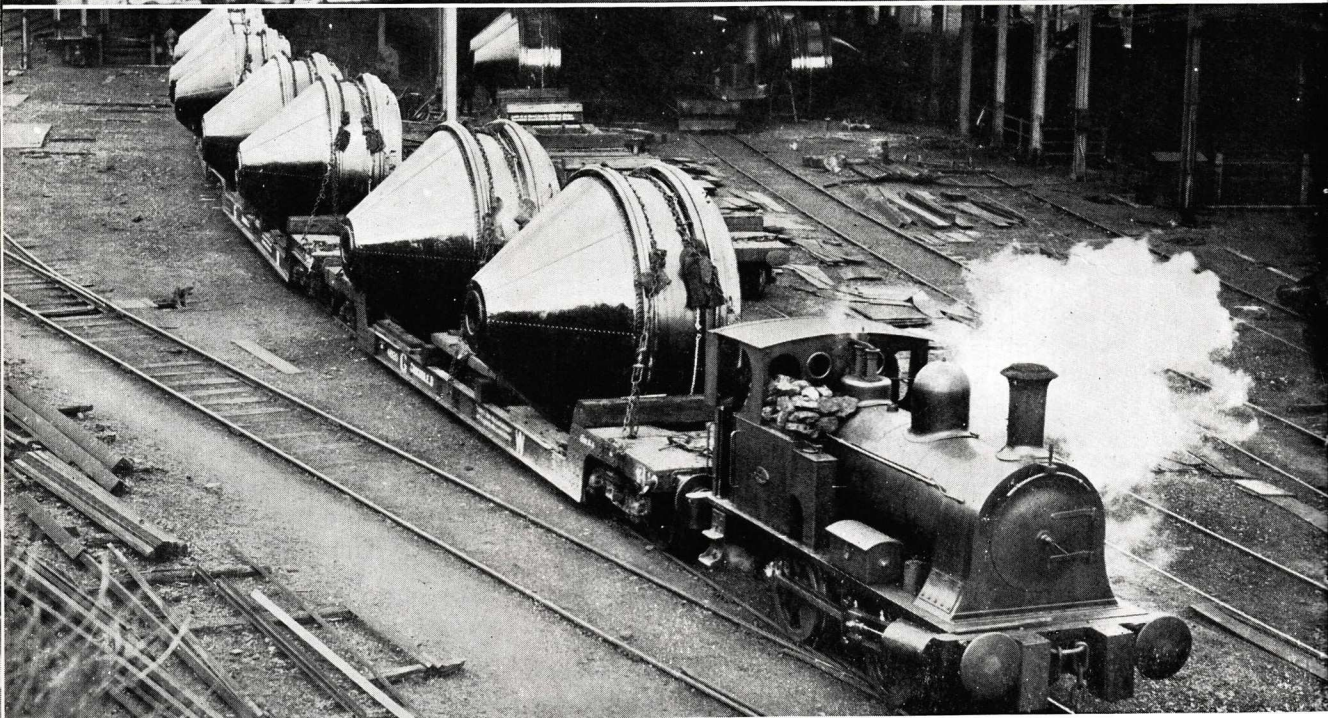
### **CARRYING THE FREIGHT LOAD**

Nearly a million loaded wagons are being forwarded on the British railways every week. Compared with 1938, the miles they covered increased in 1942 by nearly 1,000 millions. Loads in wagons carrying all types of traffic are heavier by 9 per cent. and each freight train on the average carries three more loaded wagons, an increase of 13 per cent.

The railway freight services are called upon for many special tasks. Recently the extension of runways on an aerodrome being turned



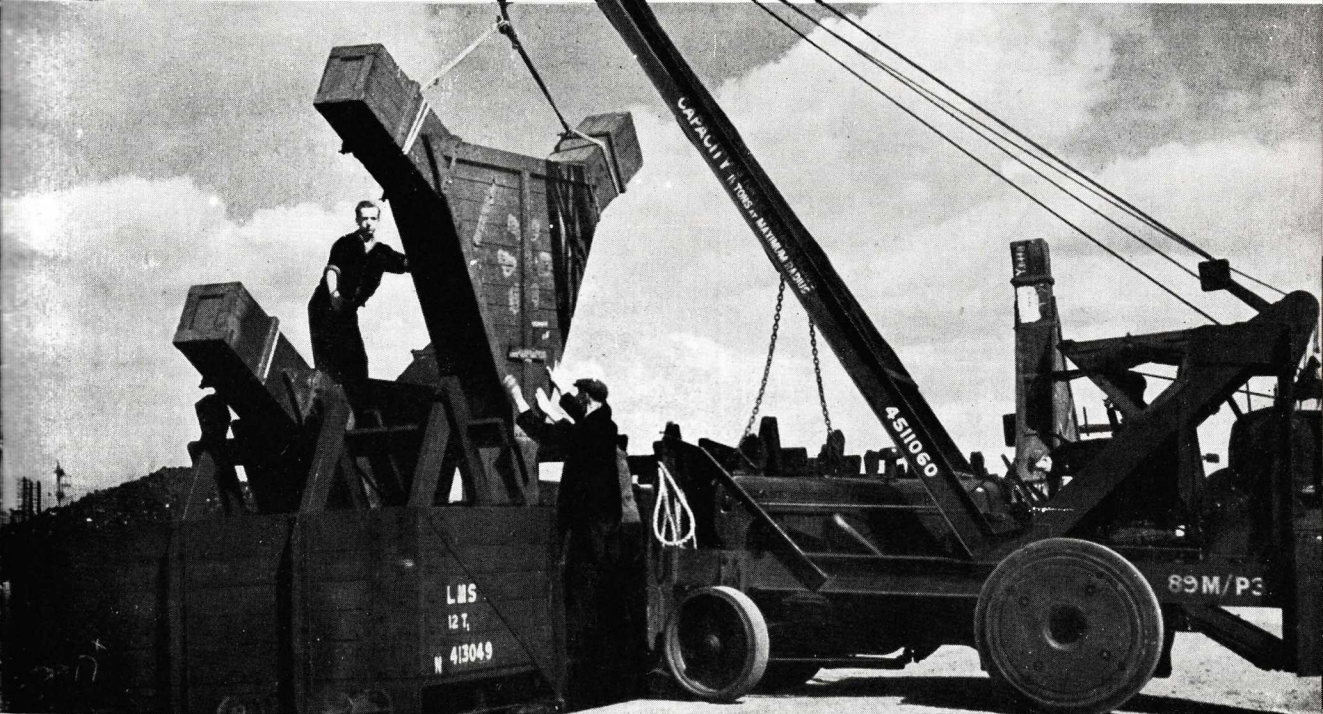
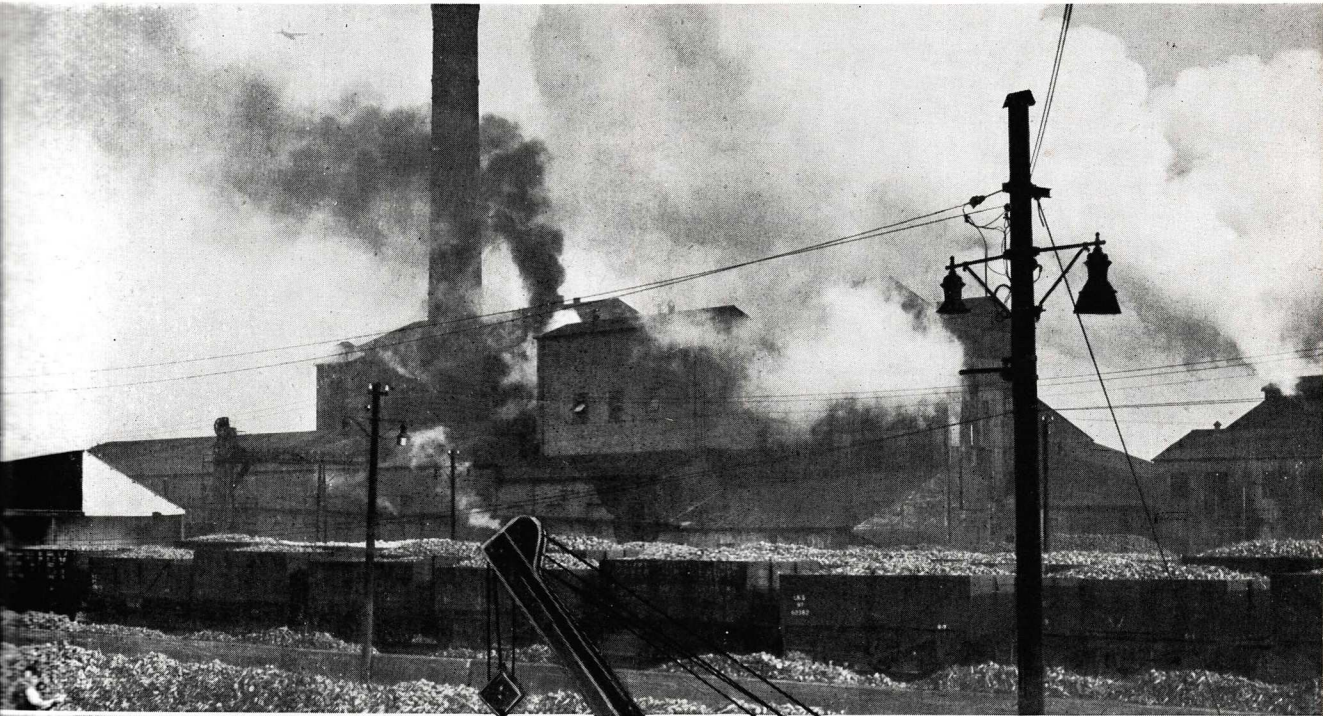
*Petrol for the tanks*



*Equipment for the Navy*



*Sugar beet by the thousands of tons*



*Propellers for the Air Force*



over to the U.S. Army Air Force, required the transport in a short space of time, of 500,000 tons of cement. Vast quantities of material were moved about the country for building fortifications, for the construction of military camps and for building aerodromes and factories. Practically the whole of Britain's four and a half million ton grain harvest has been carried by rail to storage depots and to the mills.

The movement of this huge volume of freight traffic, which is the mainstay of the nation's war production, is the subject of scientific planning. Although the public rarely see them, timetables for freight trains, worked out with as much care as are the passenger train timetables, are in use. Planning ensures that the maximum use is made of line capacity and of locomotives and that crews are available at the times and places required and know their duties and where and when they will hand over to others.

The control and manipulation of the 1,250,000 wagons which are at the railways' disposal is no mean task. Every day, at stated intervals, records are taken at yards and sidings of all wagons and their destinations. Compared with previous figures, these records show immediately where congestion or the reverse is likely to occur and remedial measures are taken. To meet increased demands for freight rolling stock and to get the best allocation of the various types, the railways have established a Central Wagon Control, a body which is responsible for the allocation of all railway freight vehicles available for loading.

The changing flows of traffic, the sudden diversion of ships from one port to another, the increase in imports and in many cases of home production, together with the shortage of man-power, have created many new problems. Indeed these factors, coupled with the ever-growing production of the war fac-

tories, the difficulties of freight working in the blackout and in particular the shortage of labour for carrying out wagon repairs and for loading and unloading traffics, have led to a general shortage of wagons which may have far-reaching implications.

Much is being achieved by a quicker turn-round campaign addressed to all those responsible for loading, forwarding and distributing wagons, but much more must be done. A recent test showed that 87,000 wagon days were being lost through wagons standing waiting to be loaded or unloaded for more than 48 hours.

## COAL

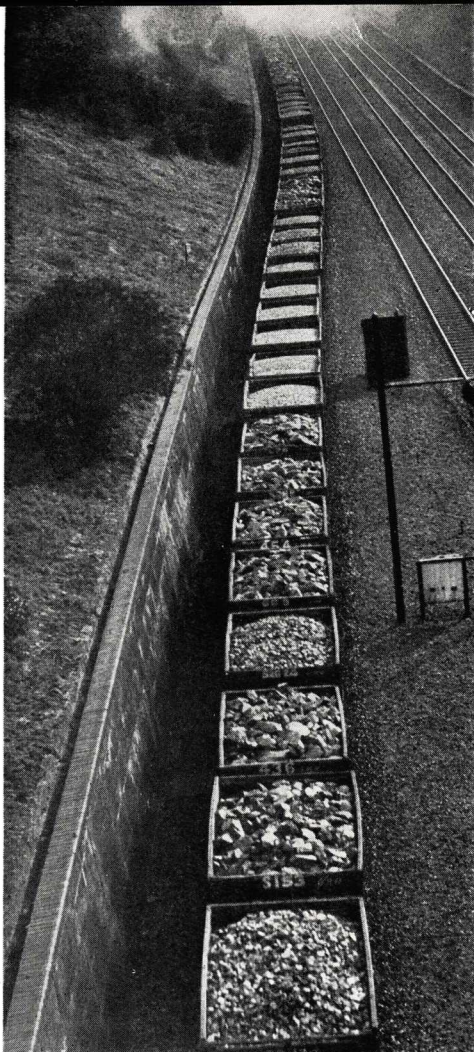
Eighty per cent. of the coal mined in Britain is carried by the railways. In 1942 this amounted to 160,750,000 tons. On its production and distribution depends the whole war effort.

In 1938 some 20 per cent. of the 227 million tons of coal mined was exported. To-day the percentage is only 3.26. Export coal involved short rail hauls and much longer hauls are needed to feed the home market, where the balance of export coal now goes. The average haul has thus risen from 46 miles pre-war to 63 miles now.

The urgent need for coal has led to the mining of opencast coal. Output in 1943 reached 160,000 tons a week; the target set for the summer of 1944 is 550,000 tons a week. To cope with this additional tonnage, and with future development, sidings and loading docks have been extended.

Stocks of coal to provide against emergencies during winter or periods of air attack, have been established and the railways have at approximately 250 places provided sites or other facilities, including the laying down of sidings, in addition to carrying the coal.

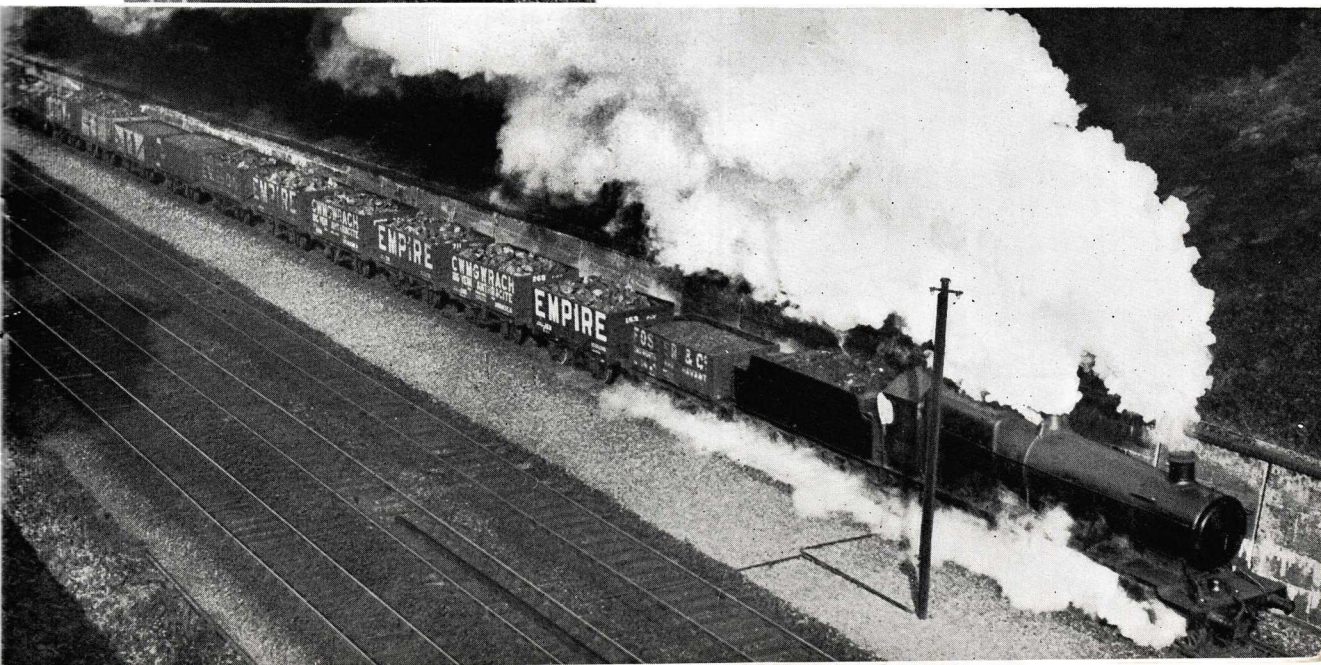




Through working of coal in train loads has always been a normal method of operation for shipment and large works, but in the early days of the war the method was extended successfully. With the close co-operation of the Mines Department and the colliery organisations a modest start of 10 trains per week from the Midlands coalfields has grown to over 400, and similar arrangements operate from Northumberland and Durham, South Wales and other coalfields. The scheme covers coal for public utility undertakings, industrial and household consumers and has been of great value in the efficient working of traffic.

Most coal from South Wales was shipped before the war and following the collapse of France the output was moved to consignees inland. A special scheme was set up to deal with its distribution. Each week the railways advise the District Trade Committee, which administers the scheme, and which is composed of the South Wales producers and the executive board of the South Wales and District coal mines scheme, of the total tonnage they can accept.

*Coal drives the engines of war*







*Factory workers need transport*

## **FACTORY SERVICE**

The railways serve the war factories. Every week nearly 7,000 special trains are run to carry workers to Government factories alone. Millions of workers travel by rail to other factories. In a year 385 million passenger journeys were made by holders of workmen's tickets. The raw materials for construction and production, the fuel, the finished and partly finished products are carried by the railways.

War makes any peaceful area a potential site for a factory, but, depend upon it, wherever a new factory has been built, the railway must be there.

Factory construction requires the rail transport of many thousands of tons of bricks, concrete blocks, steel, timber and pipes. At first all this material has to be lorried from railheads which may be some miles away;

later tracks are laid linking the factories up with the main line.

For one factory one little shed alone, with room for only nine railway wagons and five road vehicles at a time, dealt with 496,018 tons of traffic during a three years' construction period, and most of it had to be double-handled.

After the heavy construction materials come a great spate of materials for plumbing, glazing and painting. Lighting and heating appliances follow and, last of all, the production machines bringing with them many new and delicate problems of crantage. At depots serving one factory area, railway cranes performed 20,000 separate lifts during the construction period.

Many factories are very extensive. Brick and reinforced concrete buildings stretch over wide areas of country; roads and miles of internal rail track interlace them. Hundreds of miles of cable carry their electric power.



It is such factories as these that the railways did so much to help to build.

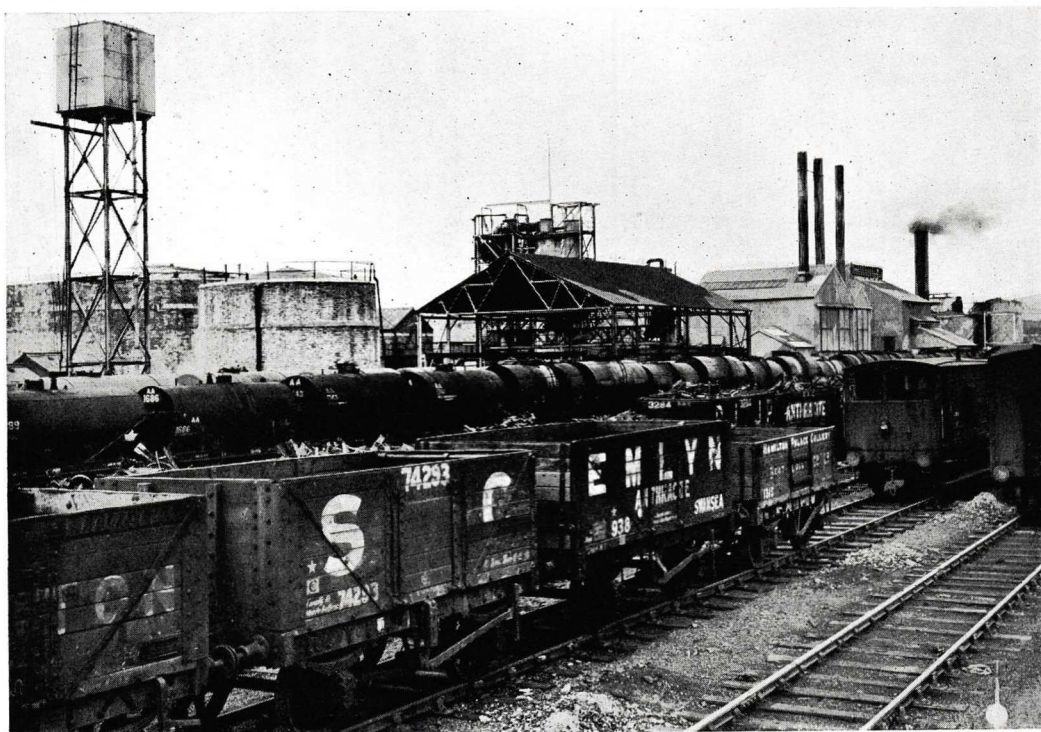
The completion of the factories was only the "end of the beginning" for the railways. The men and women, often working on three shifts, need transport—punctual transport, too—between the factory and their homes. In many cases the railways built the factories their own stations, giving direct access from the factory grounds to the platforms. New signal boxes control the working of the stations.

Repeatedly, as the output of the factories increases, the services have to be enlarged. For one factory alone 58 trains are run each day; at the peak period 10 trains leave in 20 minutes. In addition, buses make

over 800 daily trips. Though this weighty programme has had to be superimposed on an already heavy traffic on a busy main line, a remarkable degree of punctuality has been achieved.

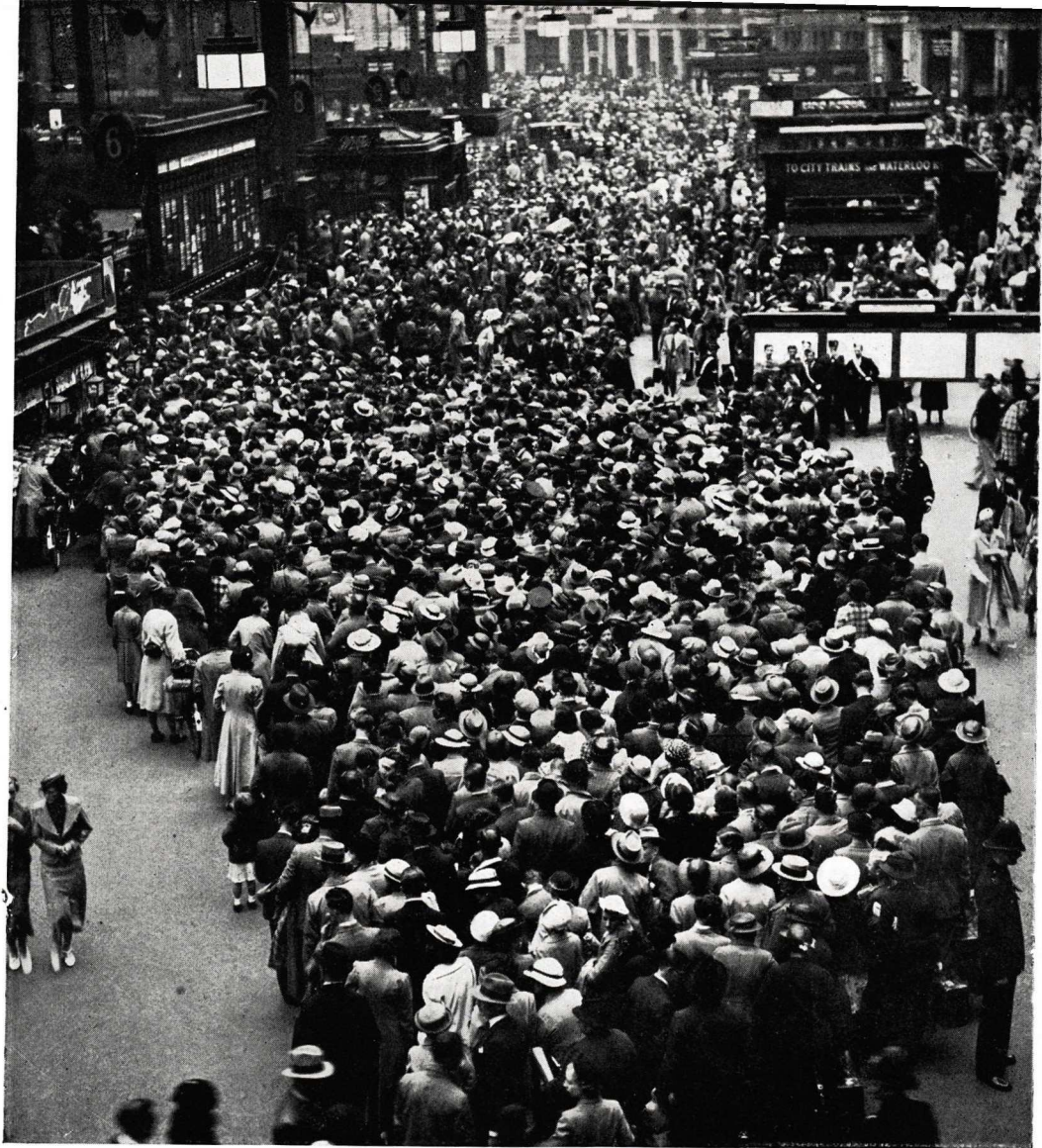
As with the workers themselves, so with the raw materials for them to work on, and with the secret lethal products that are the output of their industry. Security will not allow the telling of its volume. The railway pours the one into the factories in a constant but perfectly controlled torrent, and rushes the other out—thousands of tons of it—every day.

The railways serve the war factories, not one, but hundreds of them scattered throughout the length and breadth of the land. It is a service which only the railways can give.



*The railways serve the war factories*





*More people are travelling*

### **CIVILIAN TRAVEL**

The volume of civilian travel still continues at a high level and trains are crowded because there are fewer of them. Railway staff and equipment is diverted to the task of directly aiding the war. Absolute priority must be given to trains for the services and for workmen in the factories. Engines, normally used to haul passenger trains, are hauling war traffic ; smaller engines are doing the work of bigger

engines ; and big and small alike are hauling loads to the limit of their capacity.

The railways cannot cope with war traffics and at the same time provide the amenities of travel on a peace-time scale. At holiday times, general leave for the Forces has been suspended and appeals have been made to the public to restrict their travel to necessary journeys only.



Evacuation and the dispersal of industry increases travel and the working of two or three shifts in the factories doubles or trebles the passenger transport requirements.

Since the first evacuations, when the railways ran 4,349 trains carrying 1,428,425 passengers from the London area, they have been called upon to perform many special feats in passenger transport. The blitz was responsible for large flows of evacuees from affected areas; in one a 15 minutes' service of trains was put on to take families to billets in outlying districts. Against the threat of invasion, a complete scheme was prepared for the evacuation of the civil population from areas in the East and South coasts, and 38 trains were run for 14,600 Dutch, Belgian and French refugees seeking sanctuary here. After four years of war more holidays were taken. At Easter, the increase at the London main line termini over the previous year was 40 per cent. At a popular resort the traffic was 96 per cent. greater, and at one provincial centre 55 per cent. greater. With the limitations imposed by the Government on the number of passenger trains, such great increases in passenger travel are an embarrassment alike to the railways and to those travelling to and from work at the same time, however much one may sympathise with the

desire for a break at the seaside or in the country.

The memory of crowded war-time train journeys may linger long after normal conditions return and trains used for troops and ambulances are again free to meet the demands for ordinary recreative travel.

## LONDON TRANSPORT AT WAR

The London Passenger Transport Board, through its railway and road services, running on 3,093 miles of routes, provides transport for some 10 million passengers every day.

In addition to catering for the vast numbers travelling to and from their places of work in and around London, it is the link which, either by surface vehicle or by underground train, connects the London termini of the main line railways. Millions of members of the Allied armed forces, transferring from one main line station to another use its services.

### War-time Services

At the outbreak of war, a reduction of about one-quarter was made in the use of fuel for road services. Green Line coaches were withdrawn and converted into ambulances. Operating schedules were reorganised to give the maximum benefit during the morning and evening peak periods. To provide more accommodation on the reduced services the



*The desire for a break*

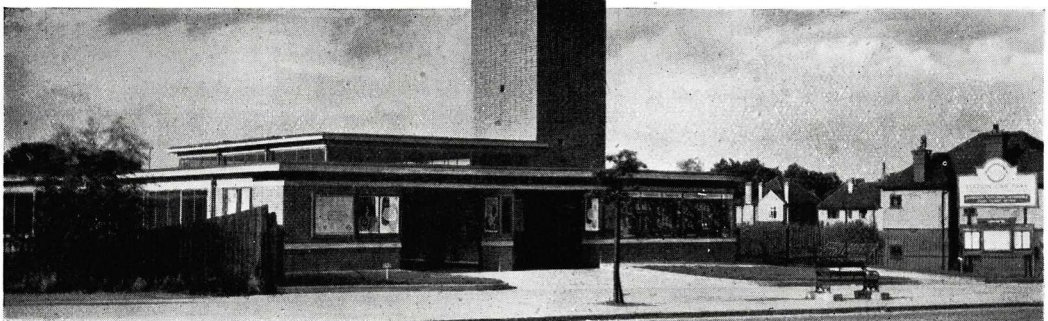




number of standing passengers was raised from five to eight and later to twelve.

The shortage of rubber and fuel as the war advanced made the need for saving miles more and more urgent. It has been achieved in a number of ways. After the evening peak traffic has passed, the service

has been reduced ; last vehicles run at approximately 10.0 p.m. Large numbers of buses and trolleybuses are parked at convenient points between the morning and evening peaks. Green Line coaches, returned from ambulance duties, again made their exit. "Curfews" have been introduced on



*(Top) The link with the London termini  
(Bottom) Modernism in station design*



Sunday mornings and week-day evenings on buses on country routes.

Much has been done to ease travelling conditions, particularly since active raiding ceased. Roadside shelters have been, or are to be erected at 572 points; cyclists can leave their cycles at many Underground stations and bus-stop queues have been made compulsory. A complete revision of the scheme of stopping places has been completed and, without infringing the blackout regulations, the lighting in road vehicles has been increased. At stations better lighting has been contrived on stairways leading to booking-halls. At certain busy inter-change stations, refreshment trolleys now enable members of the Forces to get snacks.

### **War-time Maintenance**

In the engineering departments of the Board, the problems of war have been no less acute. The blackout has increased the difficulties of routine maintenance. On tramways, nearly all maintenance work is done under traffic conditions and careful programmes have to be drawn up to avoid interference to public services. As much work as possible on the maintenance of road vehicles has been transferred from nights to days, although particularly on the bus side, most cleaning and servicing has to be done at night.

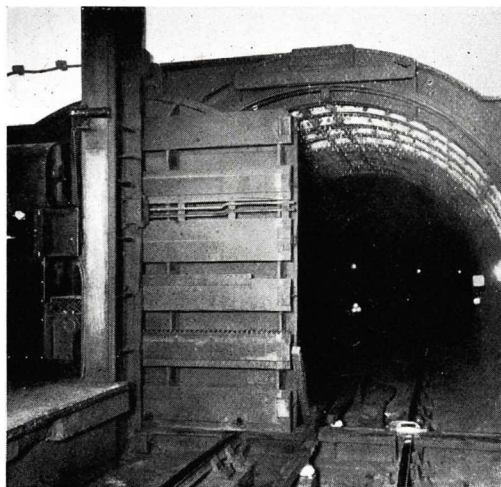
Conditions at railway depots have been eased by using low-powered lighting, extinguished when raiding is imminent. Despite the greatest difficulties, a surprisingly high level of efficiency has been achieved in all maintenance work.

### **Staggering of Working Hours**

Many of the new factories and those that "went over" to munitions production in the London area were not served with transport of any kind and the ever-increasing demands could only be met by transferring vehicles from less essential services. This process goes on.

Schemes of "staggering" of working hours have made an important contribution to the solution of the problem. So far as factories are concerned, 51 transport groups, comprising representatives of employers, employees and transport undertakings, have been established under the auspices of the London and South-Eastern Regional Board.

These groups have discussed the traffic needs peculiar to each area, and road and rail services have been co-ordinated to the advantage of over 500,000 workers. The "levelling up" of traffic demand has been



*Precautions against flooding*

extended to offices, schools, shops, places of entertainment, and in one large area, to hospital visitors. The far-reaching success of these schemes makes it highly unlikely that the advantages will be allowed to decline after the war.

### **Air Attack on London**

London Transport's systems received perhaps more than their fair share of the enemy's attentions and there was some interruption of services. Nevertheless, duty was very faithfully performed in the very worst periods.





*Provincial buses came to London*

Throughout the blitz road services were maintained in areas where bombs were actually falling, or where gunfire was heavy and there was danger from shell splinters.

The ingenuity and resourcefulness of engineering and operating staffs and the co-operation of the local authorities enabled much of the damage to be repaired quickly. Often this was done at night and services were able to start as usual in the morning.

### **Emergency Buses**

Fleets of emergency buses were kept ready to be rushed wherever they were needed—to supplement services diverted because of road damage and to assist not only the Board's own railways, tramways and trolleybuses, but also the main line railways. As many as 687 buses were employed on services of this sort in one day. When the bombardment

of London was at its height the Board borrowed several hundred buses from undertakings in other cities. Many strangely labelled vehicles, with unfamiliar liveries, were plying in the streets of London—tokens of the readiness of transport undertakings to help one another in difficulties. Later, London Transport returned the compliment and lent 283 buses for use in blitzed provincial areas.

### **Tube Shelters**

At the outset of the raids on London, tube stations were used by the public seeking shelter, and the normal business of the railway was considerably inconvenienced. Immediate steps were taken to control the number of people who could be accommodated. In conjunction with the Ministry of Home Security and the local authorities, seventy-nine stations were fitted with bunks, special sanitary equipment and clinics, and 124



canteen points established to which eleven tons of food was delivered daily by special trains. During the early "blitz" days, 177,000 took shelter during the night on the Underground. A small number still do. Shelter accommodation has also been provided for some 14,000 persons in disused tunnels and at stations closed to traffic.

The story of London Transport's war-time services is the story of an effort made in the face of great difficulties and of a constant endeavour, not only to maintain a reasonably high level of service, but to improve upon it. To this end all staff—administrative, engineering and operating alike—have applied themselves with constant diligence.



*London buses went to the provinces—this one to Coventry*





*The men to use the tools*

## **“TO UNKNOWN DESTINATION”**

It is, perhaps, somewhat glibly said that this is a war of movement, conjuring up in our minds a picture of Allied armies, surging forward irresistibly over the battlefields. But the war of movement starts very much farther back—thousands of miles, maybe, away from the scene of the fighting and the success of the battle depends primarily on the success of the initial planning that goes to the task of moving an army.

Though the Germans and Italians did not know it, their fate in North Africa was sealed in the autumn of 1942 when the first intimations were received at the operating headquarters of the British railways of an impending move of considerable dimensions.

Over a period of a month, 185,000 men, 20,000 vehicles and 220,000 tons of stores, were carried by the railways to the ports. This involved the running of 440 troop trains, 680 freight trains and 15,000 wagons by

ordinary goods services, which put end to end would be 270 miles in length.

This large scale movement, with all its complexities, had to be super-imposed on the already heavy burden of traffic which the war has placed on railway transport. It had to be carried out in complete secrecy; even the travelling warrants simply stated “To Unknown Destination.”

There are two transport sides to all military operations. One concerns the supplies and stores to give the Force the “tools to do the job,” and the other the movement of personnel with their equipment.

The stores movement usually starts first. It cannot be planned ahead with any degree of certainty, owing to fluctuations in the shipping position. To meet these conditions, the railways, in collaboration with the War Office, built up a system by which stores trains





*"The tools to do the job"*

can be put on the line in a matter of hours. Scattered throughout the country are many ordnance depots and stores. Material from the depots may be required at any of many ports. The total probable journeys, which run into thousands, have all been classified, routed and timed by railway operating experts, with the result that there exists a complete list of "shadow" services, any of which can be put into operation at short notice.

The working of the scheme is simple. Each train in the "shadow" service has a code number, so that all the military authorities have to do is to phone the appropriate railway and give the code. The railways, by reference to the list, know that the code "XYZ 1234," for instance, means that a locomotive and so many trucks, must be at depot "A" to load up and be ready to leave at 14.00 hours on a given day and go, by a prescribed route, to port "B," arriving at 06.00 hours the next morning.

The number of trains to be run each day is dependent on the rate of loading from wagon to ship at the ports. The sequence and arrival time of each train at the port are indeed most important factors. Congestion must at all costs be avoided. It would, for instance, radically upset the carefully planned loading schedule, if a train of tanks, destined for bottom cargo, were delayed and arrived *after* lighter cargo intended for top loading.

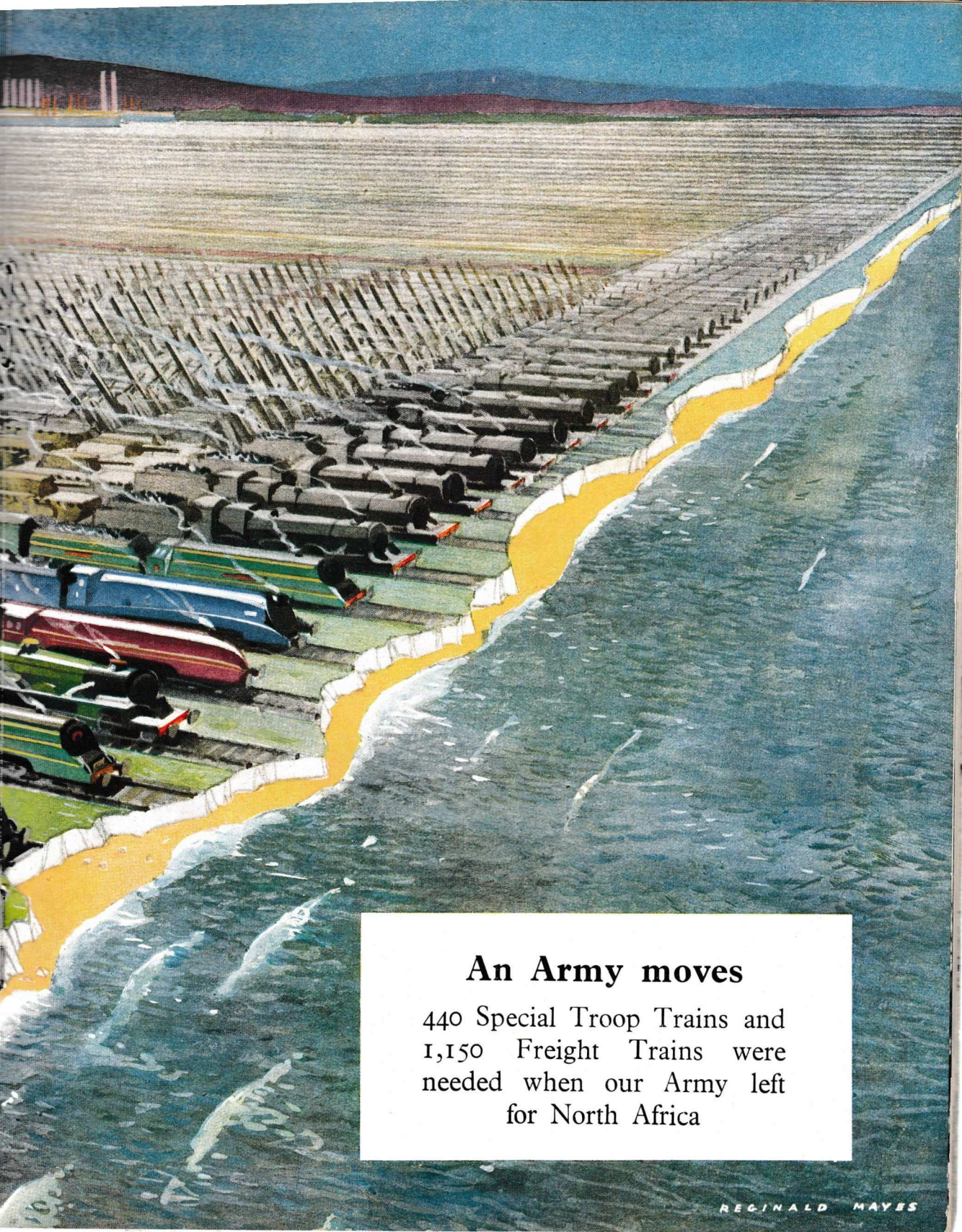
Day by day, throughout the period of the move, the railways receive from the War Office advices of the special trains required. The despatching points indicate their wagon requirements; many of which are of specially constructed types for the conveyance of modern mechanised fighting and supply vehicles. Locomotives and train crews have to be earmarked, sometimes to the detriment of normal services.

At the same time thousands of wagons, in batches of anything from 2 to 30, are on the move by ordinary freight services. They









## **An Army moves**

440 Special Troop Trains and  
1,150 Freight Trains were  
needed when our Army left  
for North Africa



carry smaller consignments from War Department depots and contractors. From one end of Britain to the other, wagons everywhere, in carefully planned sequence, are converging on the ports. Arrived in the vicinity of the port, the wagons are held in convenient sidings until they are called forward to the ship's side by the military representative in charge.

Moves of the gigantic character of the North African Force, are not carried through without constant adjustment. Day by day, almost hour by hour, changes in detailed arrangements flow into the railway operating headquarters. A ship due at a port is delayed and cannot start loading until 12 hours after schedule. The messages flash throughout the line, and the working arrangements for the particular trains involved are put into cold storage for a time. It is often necessary to put on one side at convenient points special freight trains already on their journeys until the ship is ready or another one found, sometimes at a different port.

In moving personnel the demand is for quick transit. This, in turn, demands a high and scientific degree of planning, particularly as the troop specials have to be sandwiched in among all the other vital coal, freight and passenger trains which are running on the railways.

Plans are made at a conference of railway operating experts and representatives of the Service departments and at its close everyone has a complete picture of the whole move.

The railway handling the bulk of the movements acts as "secretarial company" and the War Office acts for the Air Ministry and Admiralty. Thus the railway phase is centralised in one railway office and similarly

the services aspect is dealt with by one department.

At the conference, the service departments give the railways details of the units to be moved, the times at which they are required to be at the ports, and the points—over 230 of them in the case of the North African Force—from which they are to be moved. Then follows the specialised work of selecting routes and timing the trains so that, first, the requirements of the military movement plan are fully met, and, secondly, as little interference as possible is caused to day-to-day operations.

The schedule is a masterpiece of intricate timetable building, for the units comprising the force come from all over Britain. From one point only a few men may come; from another enough to fill three special trains. Circuitous routes have to be used, as it is not always possible for the most direct routes to carry all the trains. Halts for refreshments, exchange points between railways, provision of carriages and engine working arrangements are all settled before the staff on the line receive their instructions.

Orders go to the staff in the form of confidential special train notices; they are issued only to those directly concerned with the operation of the trains. The steps taken to safeguard secrecy are thorough and all-embracing.

The task of finding locomotives, drivers, firemen and guards presents an enormous problem. Any old engine will not do; it must be of the right type having regard to the weight of the train, the timing schedule and the route. One depot may not be able to provide, from its normal complement, all the extra engines required and others have to be



moved in. Such readjustments play havoc with the carefully arranged locomotive rosters by which the railways are getting the last ounce of work out of their locomotives. The same procedure applies to drivers, firemen and guards.

The plan arranges for the reception of the trains alongside the ships in port. The receiving stations must be kept fluid. Empty trains are timed away from the port in the same scientific manner as the loaded trains are programmed to arrive, so that as soon as the troops detrain the empty coaches are moved out of the way for the next arrivals. From the time the first train starts running until the last has reached the port, each special is watched by control offices to ensure that it arrives punctually.

The last special arrives at the port and

from the military point of view that is the end of the "movement." But it is not the end for the railways. Rolling stock and locomotives must be got back to their home areas. A large military movement of this character ends with trains being at one end of the country without a compensating load to be conveyed in the reverse direction, and much ingenuity has to be exercised in devising ways and means of keeping empty carriage and light engine running to the minimum.

For the North African Force, over 440 personnel special trains were run in 26 days, the largest number on one day being 43. When the news of the Allied landings in North Africa broke upon the world, railwaymen knew, for the first time, that the immense movement with which they had been concerned, was part of that notable operation.

*Convoys must sail on time*







*Those who direct the trains*

## EXECUTIVE CONTROL

### Planning Transport Strategy

As the Generals and Chiefs of Staff plan the battles of to-morrow, so the chief operating experts of the railways plan the strategy of rail transport. But there is no lull in the battle of rail communications; no time for consolidation and no retreat. It is a battle that is fought anew every day; a battle that is faster moving than the swiftest mechanised pursuit; a battle that involves millions of people and thousands upon thousands of tons of supplies. It is concerned with all the fighting and home fronts.

Each day and every day the operating experts work out the transport needs of a nation at war. The whole rail transport network of Great Britain is their field of battle. Their equipment is 50,000 miles of track; 20,000 engines; 64,000 passenger train vehicles and 1,250,000 goods wagons. Their troops are

the drivers, the firemen, the guards, the signalmen, the shunters and the station and depot staffs, all those railwaymen—and women—who work to load and move the trains.

All these must be co-ordinated—one railway alone runs 10,000 passenger and 17,000 freight trains every day—the equipment and staff must be used in the best and most economical way regardless of all interests save those of the vigorous prosecution of the war. The strategists of railway transport must be prepared for all the sudden demands that war may make upon their systems: congestion must be avoided at all costs, and in avoiding it the resources, in both equipment and routes, of all railways are brought into use.

In addition to the inter-railway planning conferences, each railway holds daily operating conferences, in districts, in divisions and at



headquarters to deal with the day to day incidents of the battle of the lines and to plan, as far as maybe, future requirements.

The planning of the battle of rail transport must be co-related with the wider strategy of war, both on the home front and on the fighting fronts. Energetic and close liaison is maintained with the movement and transport officers of the Services and other Government Departments. Special operations, concerned chiefly with the movement of fighting forces, are worked out, at any hour of the day and night, at conferences attended by technical railway officers, who, with their great experience and practical ability, can deploy the forces of the railways on the spot.

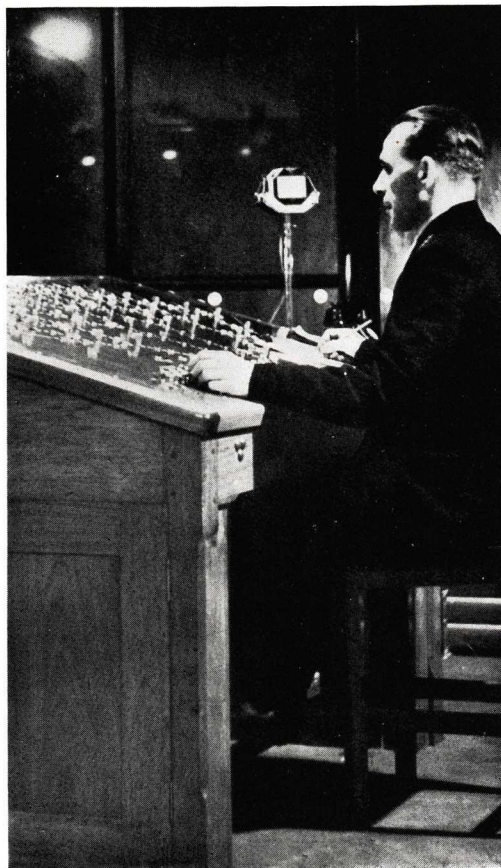
### Inter-Railway Working

The objective of the railways is to obtain the maximum effort with the minimum of men and equipment. Economy in the use of motive power through co-operation between the railways is one of the ways in which this objective has been achieved.

Footplate crews have been saved and engines have been released for other work by special investigations covering areas where two railways have motive power depots, and where at times there are odd margins of power available. Engines do not stop when they come to the point where their normal work ends and another carries on; now engines work through into other sections and on to other railways' lines, thereby saving the provision of a separate engine for a part of a day. Sometimes it happens that, say, an L.N.E.R. engine works on to an LMS line and would normally stand for some time waiting to return to its own system—what is known as unproductive train hours. To-day, instead of standing idle, it is used for either shunting or to take a train, and for this purpose the

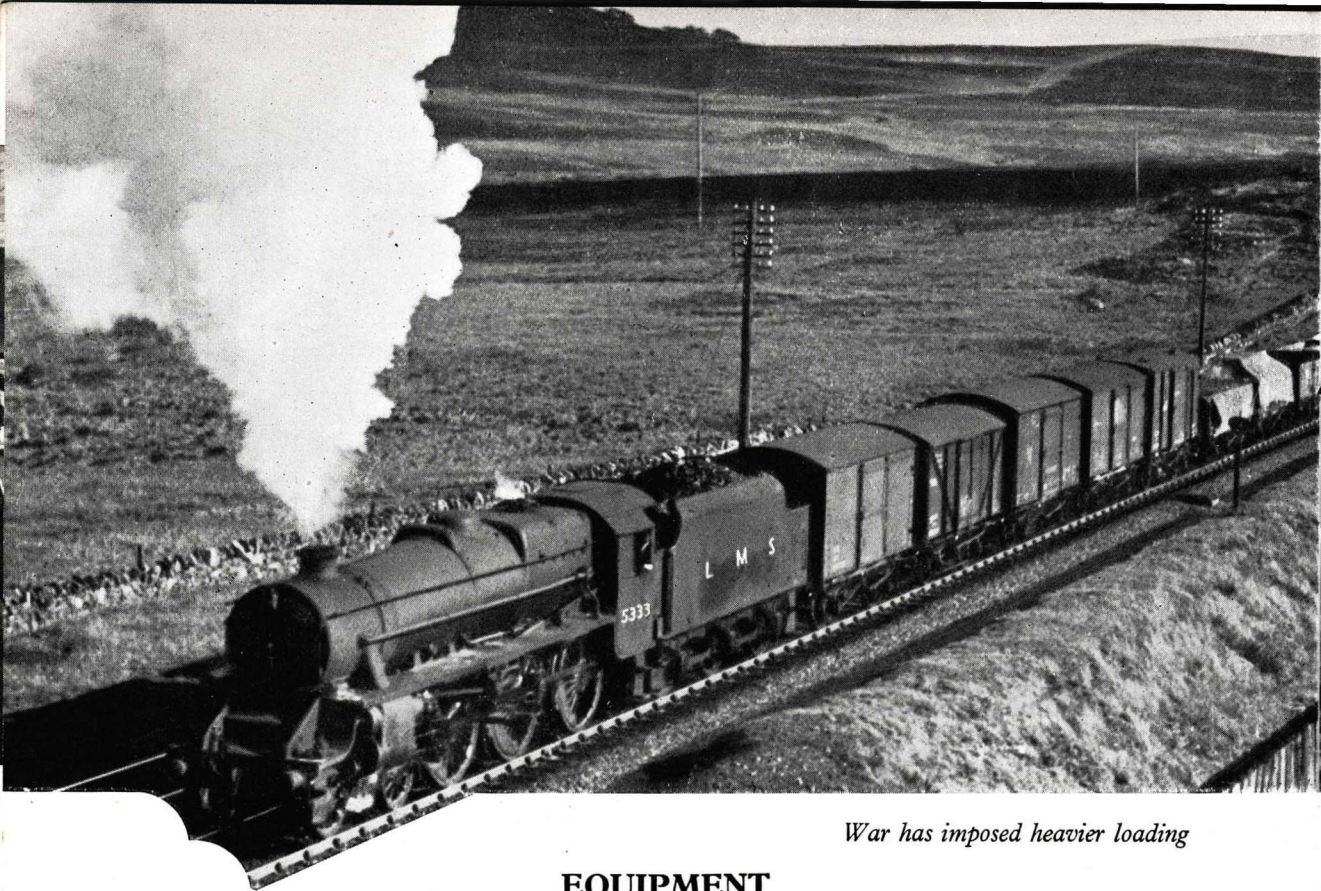
engine crews have been specially trained to "know the road."

A G.W.R. driver may work with a Southern fireman, or *vice versa*, to meet staff shortages through sickness or other causes at the smaller depots, and this saves having to send relief men from distant depots. Repair facilities, coaling plants and breakdown cranes are used reciprocally wherever this is convenient or will effect economy. In these, and many other ways, economy in the use of locomotives and staff, is being achieved in the interests of the war effort.



*Mechanised control*





*War has imposed heavier loading*

## EQUIPMENT

The work that the railways are doing in aiding the war effort has been made possible because railway equipment has stood up valiantly to the test of war. That the test has been a most gruelling one, and is by no means over, is apparent to all. A railway is an intricate organisation depending largely on mechanisation, and relying for its efficiency on the co-related working of widely scattered and diversely employed units. Failure in one aspect may very well mean failure in all. But there has been no failure and the rail transport needs of the nation have been met.

### **Locomotives**

Designers of British locomotives may well take pride in their achievements. War conditions have imposed heavier locomotive loading and longer hours in steam, while the necessity for using substitute materials in

both repair and building, and the dilution of labour, have added to the difficulties. Their design and capacity have enabled British locomotives to surmount these difficulties and to meet every demand made upon them. On the L.N.E.R. main line, for instance, 20-coach trains are regularly operated, while locomotives built solely for passenger traffic have undertaken heavy freight services.

New construction has fallen below the peacetime levels. Calls on the railway workshops in 1940 to make the greatest possible direct contribution to war production, and the increased burden of repairs, have been the principal restrictive features.

From the outbreak of war to the end of 1942, 587 locomotives were built in the railways' workshops, and 50 were supplied by outside contractors. In order to form a





pool of locomotives which could be drawn upon for use overseas, it was decided that all new heavy freight locomotives should be built to one design. The LMS 2-8-0 type was selected as the standard, one reason being that its dimensions permitted its more general use. Freight or mixed traffic types are mainly being constructed, and new designs of these types are the Southern Railway 4-6-2 Merchant Navy mixed traffic class and 0-6-0 "Austerity" freight class; the L.N.E.R. 4-6-0 2-cylinder mixed traffic class and 0-8-0 shunting tank engines for marshalling yards.

During 1943, some 212 engines were scheduled to be built and those contemplated for 1944 number 411.

In addition to the adoption of the LMS 2-8-0 heavy freight engine as a standard type, the Ministry of Supply have built their own "austerity" version of the LMS loco-

motive. Some 251 of these engines, built by contractors, are working on the railways at home, pending their use elsewhere. American engines—some 400 of them—modified for working on British railways, are also temporarily in service in this country.

It is not surprising that the strain is having its effect on the repair position. Locomotives present themselves more frequently for repair and to deal with repairs as they fall due, now demands an output in the number of heavy repairs some 20 per cent. greater than in pre-war years. In addition the man hours required per repair is greater. In order to meet the position working hours have been increased, additional staff recruited, more machine tools acquired and temporary reductions made in new locomotive construction. These, and other measures adopted, are having their effect and there is a reasonable prospect of the target of not more than 5 per cent. locomotives under or awaiting repair in the shops being achieved. To-day, the figure stands at 6.3 per cent. Repairs, it must be remembered, amount to about 90 per cent. of the total man hours engaged on locomotive construction and repair work.

British locomotives have played their part in direct support of the fighting fronts. A considerable number of locomotives were withdrawn from service for use in France at the beginning of the war, and many of these were lost after Dunkirk. 143 additional engines of the heavy freight type were later withdrawn from the railways and sent overseas to the Near East, where they are operating in Syria and Persia. The first engine to enter El Alamein after its re-capture was of LMS design; L.N.E.R. engines are working on the Haifa-Beirut-Tripoli line, while a G.W.R. engine has recently been photographed drawing supplies along the North African railways to Tunis. Some locomotives were working in England three weeks before they were in action with the U.S. army in Africa.



## Wagons and Carriages

Since the outbreak of war the railway companies' stock of wagons has increased by 28,131 and it is anticipated that 13,330 will be built in 1944. As with locomotives, the repair position is affected by the greater user of wagons and additional wear and tear. Over 32,000 railway-owned wagons are being repaired each week.

Troop movements are making heavy demands on passenger rolling stock. In addition, 886 carriages have been converted by the railways for use in 39 ambulance trains and in several casualty evacuation trains. Of the trains which went overseas prior to the collapse of France 144 vehicles were lost; 1,600 wagons were also constructed in record time for service in the Near East. Peace-time standards in appearance have had to go, but the stock is being

maintained in serviceable order. One may regret the passing of the shining paintwork of the pre-war locomotives and trains, but the efficiency of service is not impaired by the wearing of honourable "battle dress."

## Track and Structures

More weight of traffic is to-day passing over the tracks of British railways than at any other time in their history. The high standard of track maintenance reached in peace-time has enabled the railways to maintain high-speed traffic and the most intensive services in spite of the heavy loss of man-power and shortage of materials.

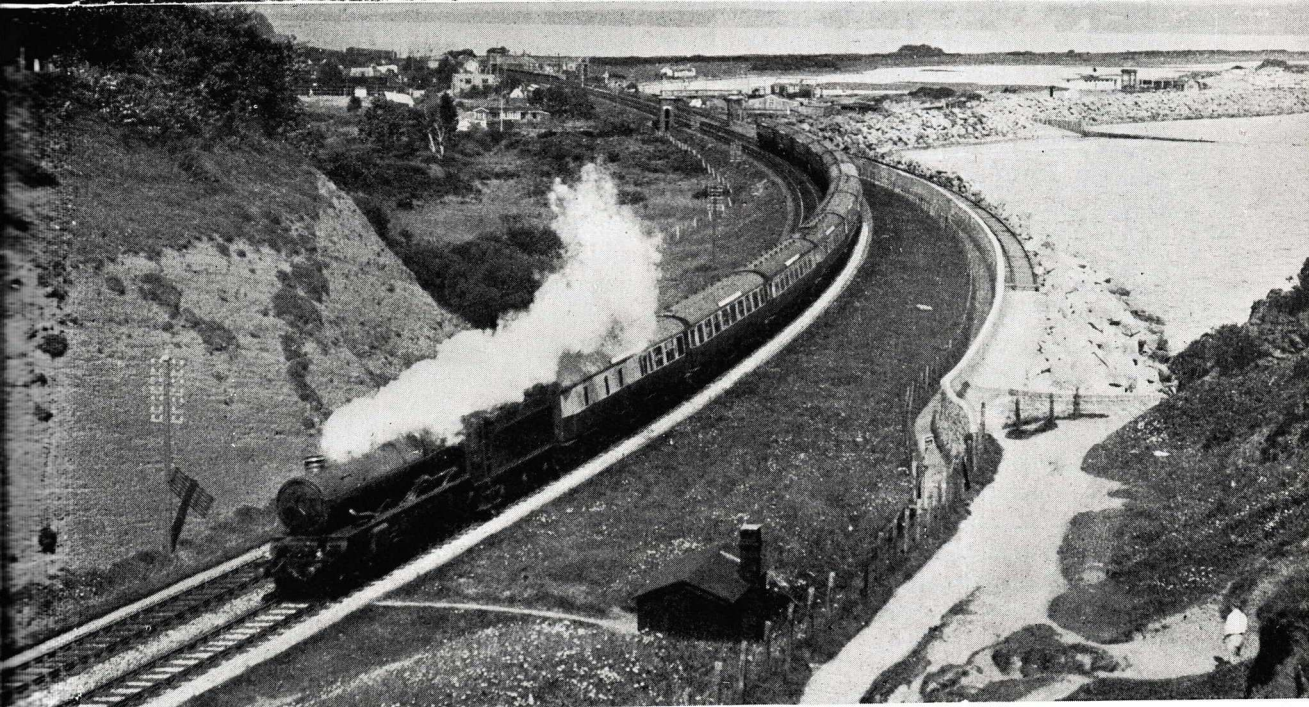
In normal times it takes over four millions of sleepers, millions of gallons of creosote, 1,700,000 cubic yards of ballast and 200,000 tons of steel rails annually to maintain the



*Since the war started—*



*—Passengers have made 4,450 million journeys*



*—Engines have run 1,870 million miles*



track. Materials in these quantities and of peace-time quality are not now available. Sleepers were almost exclusively of Baltic redwood, hemlock and Douglas fir; new supplies have been home-grown oak, beech, elm and Scotch pine. Much more track equipment is now being reconditioned and used again. To conserve timber, reinforced concrete sleepers and sleeper blocks are being used. Some concrete sleepers are even carrying the heaviest and fastest main line traffic. Altogether, on running lines and in sidings, 33,810 concrete sleepers and 772,200 sleeper blocks are in service.

Commitments of British rolling mills prevented them from meeting the minimum demands of the railways for steel rails. To fill the gap some 161,000 tons of American 39-ft. rails, representing 980 miles of track, have been laid. On some sections of line they have been welded into 78, 117 and 156-ft. lengths. A good deal of the tonnage has been used in manufacturing switches and crossings.

The practice of re-conditioning switches and crossings by oxy-acetylene and electric arc welding, successfully introduced before the war, has been extended; on one railway 83 units are employed on this work, practically double the peacetime number.

Measures taken for the maintenance of structures in wartime include the elimination of all decorative painting; the use of reclaimed timber for repairs and of concrete and other substitutes as an alternative to timber. Deterioration of structures is being alleviated by "patch" painting. Welding has been used effectively in the repair of bridges and there has been an increased use of tar as a preservative, and ex-German flame throwers, relics of the last war, have been used to kill weeds in the track to save chemical weed killers.

Thousands of bridges carrying roads over the railways have been classified for their carrying

capacity applicable to heavy military and other vehicles. In many cases bridges have been specially reconstructed or strengthened; one particularly heavy load weighed no less than 150 tons.

### New Works

Some of the many new works the railways had in hand at the outbreak of war were suspended because they were not for the time essential, but others were completed. Many others works originated during the war have also been completed. In addition, special works required as war necessities have been promoted by the Ministry of War Transport. Such works include the doubling and quadrupling of tracks, loop lines and sidings, halts and stations serving war factories and bridges.

Special measures were taken to carry out these schemes in the shortest possible time, and with the minimum equipment and labour. Mechanical earth-moving plant has been extensively used. The system of excavating material from land alongside to widen banks and tipping material from widened cuttings on to adjacent land, was adopted wherever possible. A job involving the quadrupling of track for  $4\frac{1}{2}$  miles is a good example of this method. Of 100,000 cubic yards of material, no fewer than 46,000 cubic yards were "excavated" and "tipped" in this way, with the result that the work, estimated to take 18 months before the war, was actually completed in eight months.

One Saturday, at 12.30 p.m., a railway received a request for the installation of a quarter-mile long siding, for traffic due to start arriving the following Thursday. Plans were made, a special train brought the materials to the site, and the line, complete with ballast, connection to the running line, apparatus for controlling the junction from a nearby signal-box, and catch-points, was completed by 5.0 p.m. on Wednesday, and the traffic started flowing, as scheduled, on the following day.





*Quadrupling of tracks*

### **Signals and Communications**

War has emphasised the vital importance of efficient and adequate communications. Sudden demands which the war makes upon transport rely for their planning and co-ordination on the lines of communications.

Railway communications must be maintained in the event of disruption by enemy action or by other causes. By special arrangement, G.P.O. emergency trunks, interlinking all the main railway centres, can be brought into use at short notice.

As a further safeguard against breakdown of physical circuits, a complete radio network has been built up with 42 fixed stations and 40 mobile rail or road sets. These stations have facilities for inter-communication not only between centres on each railway, but between radio stations operated by all the railways.

Very considerable extensions have been made to the communications network of all the railways and 21,000 miles of wires representing 429 additional circuits have been added to the existing routes. In addition to

new circuits for general use, more circuits have been provided to augment the railways' own traffic control telephone systems. On the Southern and Great Western railways entirely new traffic control networks have been installed. Special control systems involved, besides the erection of land wires, the installation of selective telephones, the building of control centres and their equipment with specially designed apparatus. Signal units from the British, Canadian and American forces have given valuable assistance in installing this equipment.

Developments in signalling apparatus, which were making great strides before the war, have had to be restricted. Signalling operations in war-time have been almost exclusively concerned with new engineering works undertaken to meet war requirements. As speed in completion has been the overriding consideration, equipment has been mainly of the conventional type.

### **Road Vehicles**

That the main line railways are the largest operators of road vehicles is a fact which is





*They save petrol*

not perhaps generally appreciated. To-day their fleets comprise 11,025 motor vehicles, 11,339 trailers, 9,916 horses and 25,912 horse-drawn vehicles.

The maintenance of such a fleet under progressively increasing supply difficulties, coupled with the shortage in trained personnel, has called for ingenuity and resource of no mean order. Spare parts have been in short supply and various methods have been adopted whereby worn parts, which would normally have been scrapped, have been reclaimed for further use. Various processes, including metal spraying, arc and gas welding and electro-chemical deposition, have been used with marked success. Moreover, much of the work of maintenance and repair of component parts, previously done by specialist firms, has had to be undertaken in the railways' own workshops.

A test of efficient maintenance is the overall

period vehicles can be kept on the road in a state of effective operation. Notwithstanding the greatly increased average age of vehicles, their availability for traffic remains practically the same as before the war.

Mobile workshops have been constructed to maintain the fleets in the event of damage from enemy action and to deal with repairs to vehicles operating in areas remote from road motor workshops. The resources of the railways were well tried in the blitz period. Altogether 1,007 motor and 1,178 horse-drawn vehicles and 601 trailers were damaged or destroyed. One main workshop, put completely out of action, was re-established in another district in a remarkably short space of time, the majority of the equipment being salvaged. Of the vehicles damaged, most were capable of being repaired.

Dispersal of industry and the requirements of the services have placed considerable strain on the railways' road fleets. The maintenance of these fleets in a state of repair has contributed in no small measure to the success of war-time railway operation.

### **Gas Producers for Road Vehicles**

Some 550 "gas producer" buses will soon be running on London bus routes. They will save petrol to the extent of 3,500,000 gallons a year. London Transport is engaged upon a programme of converting 48-seater petrol-engined vehicles, 83 of which are already in service. The "Government Emergency Producer," with certain modifications made by London Transport engineers, is the type in use.

Twenty-seven special service stations are being provided to handle stocks of anthracite used to generate the gas and to service the "gas producer" buses. Each bus burns about one ton of anthracite a week and requires refuelling every 80 miles.

The power developed by the "producer-gas" engine is less than a petrol unit; a loss of power most noticeable when starting with a



full load and on gradients. In consequence slightly increased running times are allowed on routes where these buses are in service. A special organisation has been set up to train garage staff and drivers. At the request of the Ministry of War Transport, and to help other operators, staff from interested undertakings obtain practical experience at a London Transport garage operating "gas producers."

Experiments have also been made on the main line railways with "gas producer" units and other alternative fuels. Two years before the war the LMS Railway co-operated with the Mines Department and later with the Ministry of War Transport, in experiments which yielded valuable information.

### **Stores**

Though the railways and London Transport have cut their requirements to a minimum, they are still very large buyers and their annual purchases cost £53,000,000.

Practically all the materials and commodities used are controlled by the Ministry of Supply. Estimates of requirements are furnished to the Ministry and, generally speaking, block quantities for a definite period are given and subsequently divided.

The demand for cloth for the Services and other organisations has caused the life of clothing supplied to the staff to be extended, and garments have, to a large extent, been standardised. The staff surrender coupons for their uniforms on a reduced ratio, based on the saving in wear and tear of their civilian clothing.

The wartime annual purchases by the railways of timber is less by 3,873,000 cubic feet than in peacetime; ballast is less by 570,000 tons; rails less by 84,000 tons; bricks by 3,621,000 and paint by 5,300 tons. Among the present annual purchases are 15,500,000 tons of coal; 3,400,000 sleepers and crossing timbers; 4,000,000 yards of cloth; 7,200,000 gallons of lubricating oil and 35,400,000 gallons of petrol and fuel oil.

## **ATTACK FROM THE AIR**

### **Preparation**

Refresher courses and information about new aerial devices which may be used by the enemy have kept the 130,000 A.R.P. workers, and the thousands of fireguards, fully "on their toes."

The railways, because of the unusual character of their properties, and because only the minimum delay can be tolerated, have complete air-raid protection schemes of their own, the personnel of which are trained to deal with damage from air attack as it occurs, so that the lines are kept open.

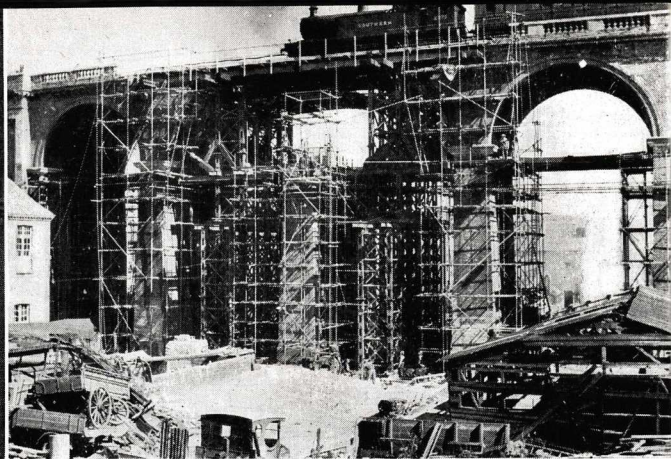
Thousands of shelters, ranging from very heavily protected control centres to strengthened rooms or basements and trench shelters, have been provided giving accommodation for some 500,000 people. Emergency control

centres have been erected and equipped with duplicate telephones.

Besides duplicating traffic control systems in places which are beyond the range of bombs or gas, the establishment of similar controls on the engineering side, ensures that trained emergency repair squads can be mobilised to deal with damage quickly by day or night. Special steps have been taken to see that current is available for electrified services in the event of damage, and inter-connection and duplication of electric power supplies have been effected for feeding trains and works.

To guard against flooding the provision of isolating doors in passage-ways leading to tube platforms, and their installation in selected tunnels, called for special engineering





*Bombs still fall on railway property*

design and work and the provision of novel machinery.

Changing and irregular hours of duty make the operation of 4,000 fireguard schemes difficult but less than 40 have failed to function through some unavoidable cause and then only for a short time.

Measures have been taken to neutralise any attempt to slow down transport by the use of liquid blister gas. Special gas cleansing vehicles, of which there are 92, are either attached to emergency repair and breakdown trains or can be used independently. Trials undertaken with actual blister gas have included the blowing up of sections of line, running condemned engines and wagons into the craters, drenching the track and wreckage with blister gases and then restoring everything to normal. Low flying attack by liquid blister spray has also been experimented with and combatted.

### **The Trains Got Through**

Though the period of the blitz is for the present over, bombs still fall on railway property, in the South-East and Eastern districts particularly. Even through the worst period, the lines were never seriously interrupted. Railwaymen and women stuck to their posts and got the trains through.

A train cannot dodge a plane or a bomb—it just has to stop or keep on. One pitch black

night the 8.45 crowded with service men and civilians was travelling at reduced speed through the blitz. Suddenly the track immediately in front of the train received a direct hit and where a second before had been two sets of lines, was now a yawning crater into which the engine plunged, taking the driver and fireman to their deaths. The tender mounted the engine and the carriages were fantastically fanned out behind, yet, with the exception of the unfortunate driver and fireman, the only casualties were two slight injuries. By 5 p.m. the next day all the coaches, one of which had been blown down a steep embankment, had been re-railed.

The women were not to be outdone by their male colleagues in bravery and fortitude; one telephone operator at a main railway exchange refused to leave her post though the building was in ruins around her.

One bleak December afternoon a bomb hit a passenger train in a rural district. The driver and guard were killed, but the fireman blasted from his footplate, crawled back and at great risk of severe scalding, shut off the steam. Then, with a woman porter, he took charge until help arrived.

Then there was a horsekeeper who brought out of stables, set ablaze by incendiary bombs, 24 horses, knowing all the time that his own home was burning.



Many such stories of bravery could be told. One George Cross, 28 George Medals, 76 British Empire Medals, 9 Members of the Order of the British Empire and 127 Commendations for bravery have been awarded by the King in the honours lists to the staff. For each railwayman so honoured, a hundred courageous acts have been performed, each one part of the daily job. The men and women of the railways may well be proud that their fortitude, bravery and competence have brought them through a terrible test triumphantly, but with many casualties.

### **Damage and Repair**

The courage of railwaymen and women in the midst of bombing is matched by the speed with which the engineers repaired broken and debris-littered tracks and quickly enabled services to be resumed.

Since the start of the war 10,000 attacks have been made on the railways. With the exception of Coventry, probably the most bombed section of line was one of  $2\frac{1}{2}$  miles near London, with 92 attacks in a period of nine months—but it carried on throughout, though

not without difficulty and many improvisations.

Undoubtedly the skill of the engineers and the hard work of the gangs was helped by the organisation for dealing with damage set up before the war. Emergency breakdown trains and stocks of rails and other permanent way stores, bridging and filling material were located at strategic points. Much of the material was loaded on wagons in position for despatch. Gangs could be mobilised immediately and arrangements existed for reinforcements to be drafted in from districts adjacent to the damage.

The experience of Coventry in the attack on the 14th November, 1940, has been officially described as “an experience without precedent in the history of a British city.” It is equally true that this attack is without precedent on the railways, and one that called for all the resource of the engineers to restore communications.

It was made by 400 bombers ; and 600 incidents in the city were reported. Of

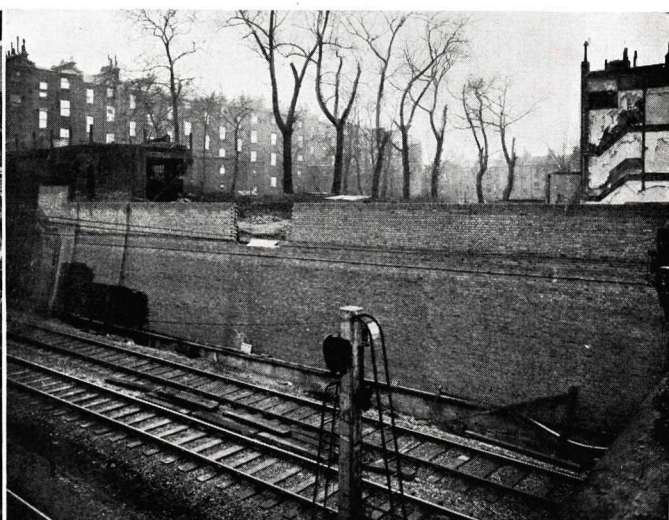
*Railways are a vital target*





these, no fewer than 122 were on railway property. Station, sidings, junctions, main and branch lines, bridges and viaducts were hit; one  $3\frac{1}{2}$  mile stretch of line receiving 40 H.E. bombs. So well did the engineers and the gangs do their work—and again quoting the official record—“By the evening of the 16th the report came through: Coventry-Birmingham, and Coventry-Leamington clear.” Damage to other lines was

them being pushed over by the thrust of the arches beyond them, and the overhanging portions were made safe with steel wire ropes. The site was cleared, foundations prepared, and heavy steel trestling erected in such a way that a new pier and arches could be built later. Horizontal steel framing was constructed to relieve the temporary tie rods of the thrust of the undamaged arches, and trestles were carried up to support steel joist waybeams



*The trains must go through*

more severe, but before the end of the month working everywhere was normal.

Where structures such as bridges, arches and viaducts were damaged, temporary repairs were usually carried out so that traffic might be speedily resumed. Recently a 70-ft. high viaduct had one of its piers and two arches carried by it demolished by a bomb. Rails and sleepers and one parapet hung precariously over a 70-ft. gap. The first job was to make the remainder of the viaduct safe. The piers adjacent to the gap were tied by steel rods to the next one to prevent

spanning the gap. The track was reinstated and traffic returned to its normal route just short of five weeks after the damage.

At one London station, beneath an important road junction, and with a concourse immediately below street level, a bomb penetrated the roadway and burst in the concourse. The blast demolished the covering over the station, which is about 150 feet across, and wrecked three escalators. It injured a number of people on the platform, and the windows of a train standing in the station were blown in. Repair gangs immediately got to work;



a bridge was erected to carry street traffic over the road junction, and temporary stairs were erected on one side of the escalator tunnel to enable the station approaches to be restored to service. Sufficient space was left to erect a new escalator and the station was in full use again in two months.

A bomb falling at the side of a long viaduct carrying a main line of railway shattered one of the piers. This began to subside slowly, and had the movement not been stopped, the arches at each side would have collapsed and probably brought down with them several more arches.

Within 48 hours the weight of the arches and track was taken off the pier by massive baulks of timber, which had to carry several hundred tons, and in less than a fortnight the pier was completely rebuilt.

### **Black-out and the Blitz**

Running the trains in war-time is certainly not an enviable job. Not only have the railways been called upon to tackle the biggest job in their history, but they have, through the necessity of war, had to undertake it under the worst conditions that could be envisaged. Its successful accomplishment, even under the best of peace-time conditions, would have been no mean feat.

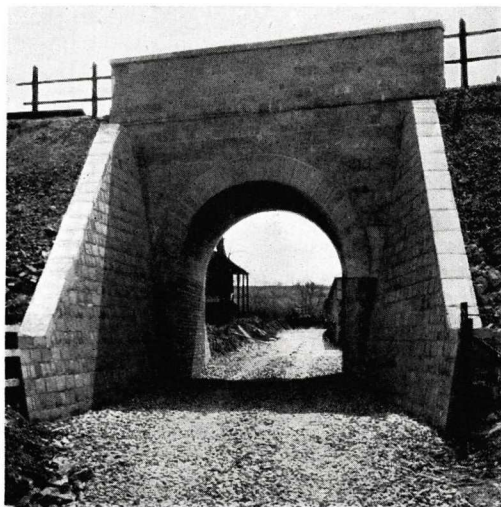
Railway practice demands light in abundance—at stations, in yards, goods sheds and locomotive depots—because it is through the night that the great bulk of the freight traffic moves. In wartime good outdoor lighting is one thing railways cannot have and the restrictions, despite some alleviations, remain the most persistent drag on railway operation. By screening goods sheds and portions of stations the position has been eased to a



*Damaged—*

limited extent, but the black-out in yards, sidings and depots is beyond such treatment.

For reasons of security the railways have never been able to tell the story of their fight in the early war years against the black-out, the weather and the blitz. Passengers, sub-



*—Repaired*





*Railway practice demands light*

jected to hours of delay, fretted and fumed and only now can some of that story be told.

Until November, 1940, there were rigid speed restrictions on trains during alerts. A passenger train, travelling at the prescribed 25 miles per hour during daylight, or 15 miles per hour at night, might, over a 250 miles journey, be 12 hours late solely due to these restrictions. Railway working is so interwoven that interference such as this cannot be confined to the area in which it originates and delay at one point re-acts on others hundreds of miles away. The weary passenger, unable to see any tangible cause for delay, and not even hearing of the alerts or bombing elsewhere, may perhaps be excused for displaying a little irritability.

During the blitz actual raids, or warning of raids, followed one another with such frequency and were of such long duration, that recovery from one and its incidents could not be made before another had started; thus their effect tended to be cumulative.

Enemy air activity impinged upon all aspects of railway operation. It produced many operating problems which called for the exercise of unprecedented tenacity and ingenuity in their solution. It caused waste of man-power and the staff, particularly trainmen, had to work exceptionally long hours.

The British railway system is the most intricate in the world, with more junctions in relation to route mileage than any other country. This system undoubtedly facilitated the alternative routing of traffic, and made it possible despite alerts, bombs and the blackout to move the traffic. The operating problems were, however, tremendous. Divergence from normal arrangements caused complications which could only be resolved by improvisations of the staff on the spot and by the executive control. To add to these complications, the shortage of trained man-power was acute. Railwaymen are not made in a day and the constant change in personnel involved a great deal of training, over lengthy periods, of new entrants into the service.



## THE STAFF

The total staff employed by British railways and London Transport is 668,145; of these 114,000 are women and the wages bill for 1943 was £192,562,000.

Over 110,000 men and women are serving in H.M. Forces and in full time Civil Defence; 4,600 have been loaned to industry and 240 to Government departments. 2,140 railwaymen are prisoners of war, or are interned in neutral countries.

Nearly 100,000 railwaymen are serving in the Home Guard and 130,000 are fully trained in civil defence work.

The successful fulfilment of all demands which the war has made on the railways has occasioned unrelenting toil on the part of their staff. These men and women have a record of dogged endurance and self-sacrifice of which they can be justly proud. As a body they have never failed to respond to any calls made upon them by the circumstances of war.

Despite the arduous nature of their work, despite the difficulties of black-out and the press of winter's storms, despite attacks from the air, railwaymen and women are "on top of the job," mentally and physically, and they are in no way dismayed by the prospect of still heavier demands likely to be made upon them.

Many years of discussions through the railway machinery of negotiation have undoubtedly built up between men and management a relationship of mutual confidence and a spirit of co-operation. Indeed, the high morale of the staff of British railways and London Transport is a striking testimony, not only to the character of our railwaymen, but also to the principle of collective bargaining. Without this spirit of co-operation the railways could not have been of the same service to the community at this time of national emergency.

### Spare-Time Services

Railwaymen and women are to be found in all the spare-time activities. They are serving in the Home Guard, Civil Defence, the Royal Observer Corps and the W.V.S. The railway Home Guard units, formed when Mr. Anthony Eden made his dramatic broadcast, now have their ranks filled with trained and well-armed soldiers. Railway units are serving with the Royal Artillery in A.A. batteries.

Ambulance training has for many years been a voluntary part of railway work, and some of the staff annually qualify for certificates. This training has been of great value in war conditions.

### Canteens

Before the war there were 189 canteens in operation, and there are now 391 and another 100 are in course of construction; a further 240 will follow. Delay in the provision of canteens has been caused by shortages in labour, building materials and canteen equipment.

In addition to canteens, by arrangement with the Minister of Food, facilities are provided for enginemakers and guards lodging away from their home stations or working long hours to buy additional supplies of food to meet their needs.

### Serving in the Forces

Of the 110,000 railwaymen and women in the Forces, 2,680 hold commissioned rank. They range from 2nd Lieutenant to Major-General in the Army; Midshipman to Commander in the Navy; Pilot Officer to Wing-Commander in the Royal Air Force, and there are 11 women holding commissions in the A.T.S. and one in the W.R.N.S.

Many of the men holding commissions have risen from junior ranks in the railway service. A porter, a goods shunter and a clerk are



Majors in the Royal Engineers ; an erector and a clerk are Wing Commanders ; two other clerks are Lieut.-Commander and Lieut.-Colonel respectively ; a sub-station attendant is a Major in the Royal Corps of Signals and a chargehand is a Major in the Pioneer Corps.

These services have been recognised by many awards. An Able Seaman on H.M.S. *Broke*, a scaffolder on the railway, earned the D.S.M. for outstanding endurance and devotion to duty while his ship was leaving Algiers harbour under fire during hazardous operations in connection with the North African landings. In spite of fumes and smoke from a shell which killed all but himself and one other in the wellhouse, he stayed at his post.

A Lieutenant-Colonel, who was in peacetime an Assistant District Locomotive Superintendent, was one of six who, ignoring the warning that they were on a suicidal mission, boarded the burning liner "*Georgic*" after she had been fired by enemy bombs at Suez, and salvaged a captured German tank. The action enabled the War Office to learn the secrets of the tank's new design. For this he was awarded the George Medal ; he also holds the O.B.E. and has been mentioned in despatches.

The M.M. was won by a former goods clerk, serving as a sergeant in the Black Watch, for releasing wounded comrades from a blazing tank under shell and mortar fire. Later during the battle of Wadi Akarit he went, under mortar, sniper and machine gun fire to the relief of a small force, cut off, with several badly wounded and got them all back.

A carter, who had become a Pilot Officer, was posthumously awarded the D.F.C. for the part he played in a low level attack on Warnemunde. Even when on active service the railway tradition holds. A sergeant, an ex-railway clerk, received the M.M. for driving an engine and four trucks across a heavily bombed and blazing railway bridge to ensure supplies for his brigade.

Of one sergeant, a railwayman serving with an Army Film Unit, it was said by his Colonel "but for this sergeant the film *Desert Victory* would never have been made."

### Railway Units in the Forces

Several railway and other units of the British Army are composed largely of men from the British railways. It is not aimed in these few paragraphs to draw a picture of spectacular achievement ; but, rather, to call to mind some few instances—selected from many—of hard and willing toil, initiative, adaptability and solid performance.

Towards the end of 1941 British railway units took up the job of operating the Trans-Persian Railway for about 575 miles from the Gulf to Teheran where they handed over to our Russian Allies. The line is single track throughout and in the mountain sections rises at two points to an altitude of nearly 7,000 ft., and on its route there are nearly 5,000 bridges and some hundreds of tunnels. In places the summer heat is appalling, particularly from the Persian Gulf for about 150 miles until the railway starts to climb steeply.

Before our troops took over, the line was equipped to handle only two trains each way daily, but actually the traffic was only one daily train of light load. Out of the total loco stock only about 20 per cent. was found fit for use, and many of the wagons were needing repair. There was, therefore, work for railway construction companies to increase line capacity by the construction of new crossing stations ; for railway workshop companies to repair existing equipment and to assemble large numbers of new locomotives and wagons imported from U.K. and U.S.A. ; for a transportation stores company to deal with new equipment and spare parts as they arrived in the country ; and for railway operating companies to deal with as much traffic as the facilities would permit. In the space of about one year there was a tenfold increase in the through traffic carried.



At the beginning of 1943 responsibility was transferred to U.S., but British railway units can justifiably reflect that it was their labour which prepared the way for the large and steady flow of aid to Russia which now passes by the route which they opened.

In the Movement Control units and Docks Operating companies in Middle East, as in all other theatres, numbers of railwaymen are working. Railway workshop personnel in 1941 reconditioned and put into service old Turkish engines which were laid aside as derelict many years ago and which had since rusted until one could poke a stick through the side of the smoke box. They established their own self-contained workshops at Jaffa and elsewhere, and have been engaged in normal maintenance and heavy repairs; they have assembled many of the engines and wagons imported into Middle East.

British railway operating units have taken a share, together with New Zealanders, in operating the Western Desert Railway: they have also been employed on Palestine Railways to compete with a heavy increase in traffic.

In North Africa there has been a similar history of successful performance and British railway units have been working alongside their American counterparts. Depots have been built in rapid time, and track and many demolished bridges (steel and masonry) have been repaired quickly and with ingenuity. Assistance was given initially to the civil railway administration in operating trains eastwards from Algiers, and subsequently there was full military operation of the railway in the forward areas. The first train into Tunis ran five days after the city had been captured.

In North Africa, as on the Western Desert Railway, invaluable work was done in repairing, maintaining and constructing communications by railway telegraph units.

In Sicily where trains were operated within a few days of the first Allied landings; and

now on the mainland of Italy, where railway units of all categories are making a vital contribution to the success of Allied arms.

Finally, one must not forget the work which has been and is being done by British railwaymen serving in transportation units at home and in other theatres throughout the world where active land operations have not been taking place. Much valuable service has been performed both at home and overseas and extensive works have been executed.

The record of training of units serving at home is a history in itself, and the task which lies before them may prove even bigger than any which transportation units have yet been called upon to undertake elsewhere. We may confidently look forward to the success of their achievement when the time comes.

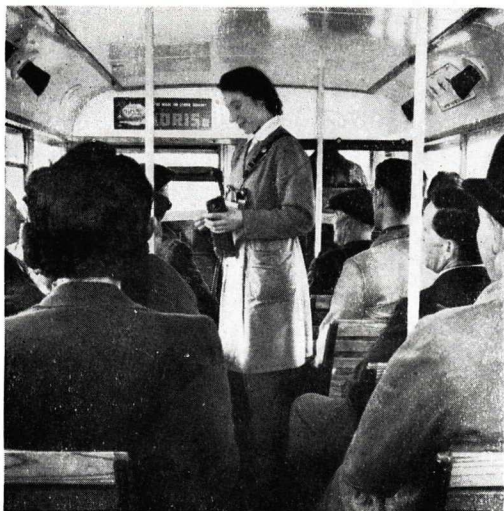
### Women

Just over one-sixth of the staff are women. Before the war 26,000 women were employed mostly in clerical grades as shorthand-typists,



*Men are gone—women carry on*





*The first went into service in 1940*

machine, telegraph and telephone operators. Small numbers were also employed as carriage cleaners, waiting-room attendants, cooks and messroom attendants, crossing keepers and office cleaners.

Now their activities have spread to many other spheres of manual and non-manual work, heavy and light, dirty and not so dirty. They issue and collect your ticket; announce your train over the loud-speakers; carry your luggage; collect, sort, load and deliver your parcels. That well-kept horse which draws the railway cart bringing goods to your door is probably driven by a woman and groomed by one.

Women help in the maintenance of locomotives and rolling stock. They work on the permanent way. A railway depot making concrete sleepers is staffed entirely by women. There are women architects and draughtswomen; crane operators and gas fitters; painters and signalwomen; passenger train guards and motor-van drivers; woodworkers and metal workers.

London Transport has women bus conductors, the first of whom went into service in July,

1940. At the garages women clean, wash, oil and grease the vehicles, and some help to shunt the buses into position ready for the morning's "run-out." In the Board's workshops, garages and depots are 3,500 women, 1,000 of them doing semi-skilled work, and over 100 are employed on skilled work.

Like their sisters in other industries, many railwaywomen have husbands in the Forces, and homes and children to care for. Work does not finish at shift's end, but despite their domestic responsibilities they carry on their war-time jobs with a fine determination, knowing that on them depends the turning of many wheels, wheels of wagons and locomotives rolling over the iron road bearing a thousand and one necessities for the home front and the fighting fronts.

### **Welfare**

Welfare work has always been regarded as a matter of high importance by the railways, and war-time conditions have increased the scope and value of the work, especially on the problems arising out of work in "black-out" conditions, provision of amenities for fire-watchers and rationing. The large number of women and girls employed has led to the



*They work on the permanent way*





*They groom the horses*

appointment of many additional women welfare supervisors. They advise on suitable employment for women, their hours of work and shopping facilities; advise on the provision of messrooms and restrooms; help to smooth out personal problems; advise and assist the staff in connection with social and

recreational facilities and look after their health.

Welfare supervisors also attend to the interests of male staffs, although the necessity for their employment does not arise to the same extent as for women staff.

## TRADITION OF THE SEA

At the outbreak of war the railways owned 130 steamers, with an aggregate tonnage of 176,145. The fleet was specialised, being largely made up of fast twin-screw turbine cross-channel passenger and mail carrying steamers or short journey coastal paddle steamers. Comparatively small cargo boats, ferries, tugs and other specialised craft made up the remainder. Ninety-two have been chartered by the Government for varying periods.

From the start of the war services to the Continent, the Channel Isles, Northern Ireland, Eire and the Western coast and isles of Scotland, were maintained with reduced

fleets. The effect of this reduction is evidenced by the Clyde service from Craighendran to Dunoon, which in peace-time was maintained by five ships, and now by one. Although 55 years old, she has run every week-day, and during 1942 carried over 200,000 passengers in addition to cargo.

Orders restricting the illumination of navigational lights, and the occasional closing of ports, involving the cancellation of services and the diversion of passengers, mails and cargo to other routes, have added to the difficulties of wartime operations. And always, of course, there are the perils of mine-infested waters, attack from the air or from submarines.



The last passenger sailing from France was made by a railway steamer. The ss. *Hantonia* left St. Malo with passengers and troops, arriving at Southampton on June 17, 1940. She was not, however, the last vessel to leave ; that distinction fell to another railway-owned vessel, the ss. *Hodder*. When ordered to assist the evacuation, she arrived to find that all troops had embarked. She therefore took in tow a disabled Admiralty store vessel, laden with ammunition and petrol, and brought it safely to port.

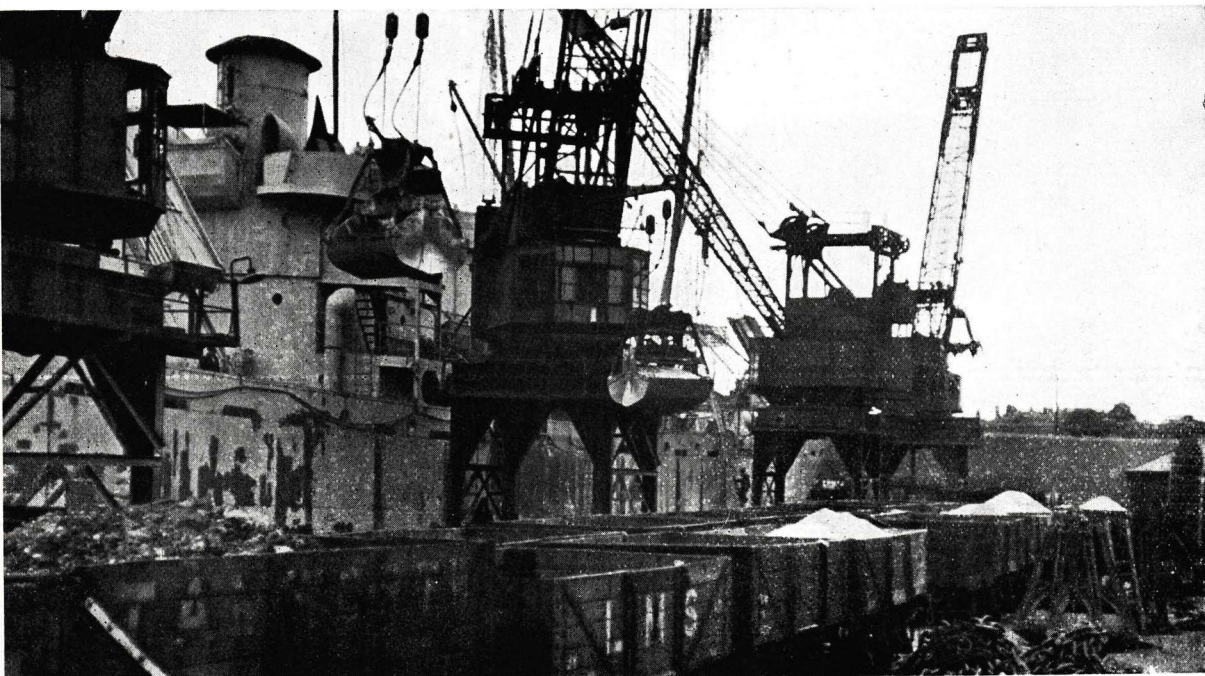
Services to and from the Channel Isles continued until June 28, 1940. On this date the *Isle of Sark* and two railway cargo steamers were loading at St. Peter Port when, shortly before 7.0 p.m., three enemy planes dropped bombs on the pier. The attack developed, and more raiders came in, dropping bombs and machine-gunning. The raid continued for an hour, and eventually the *Isle of*

*Sark* left at 10.0 p.m. with 647 passengers, arriving at Southampton at 8.30 a.m. the following morning.

The steamers chartered by the Government are used for a variety of tasks, including duty as hospital carriers, transports, assault ships, minelayers and sweepers, ammunition carriers, ack-ack ships and rescue ships sailing with Atlantic convoys. Apart from those flying the White Ensign, railway steamers on charter are still manned by their peace-time crews.

They have been engaged in many actions with the enemy. Twenty-three of them have been lost since the war began. Others have given a good account of themselves in many a stirring adventure.

The ss. *Biarritz*, used as a leave boat in the last war, and prior to this war engaged on



*The ports are busier*

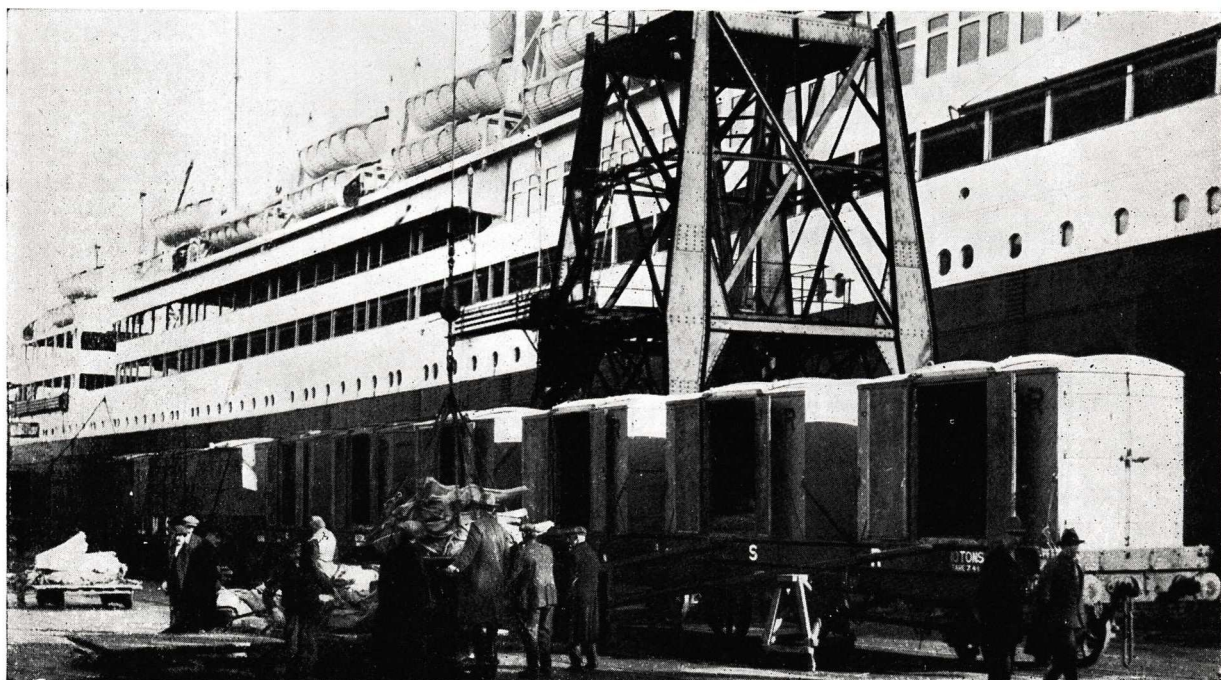


the Folkestone-Boulogne service, must be known to thousands of passengers. Passing Gravelines, en route for Dunkirk, she came under enemy shell fire. A shell, which passed right through the ship, pierced an oil pipe and a steam pipe serving the forward boilers and severely injured a fireman. Despite scalding steam and the possibility of fire, he made vain efforts to close the oil supply to the furnace. Finding this impossible, he managed to clamber his way up two ladders to report the position. Having done so he collapsed and died the same night. The ship was all the time under shellfire. Meantime, the Second-Engineer in charge of the after boilers, closed the supply of fuel to the forward boilers. He tried to get through a water-tight door to the forward compartment, but was driven back by scalding steam. To get the ship out of range and to avoid stopping in a minefield into which she had turned, the after boilers

had to be kept going. Despite falling pressure and water level, the Second Engineer managed to do it and the ship clawed her way to safety. He was awarded the D.S.C., and the fireman was mentioned in despatches.

The *Duchess of Fife*, before the war on the Clyde services, has swept mines off the East Coast and is now training officers and ratings for new minesweepers at the rate of 50 a week. She has steamed nearly 100,000 miles since the war began. H.M.S. *Goatfell* (ex *Caledonia*), H.M.S. *Scawfell* (ex *Jupiter*), H.M.S. *Mercury* and H.M.S. *Helvellyn* swept the Clyde together in the earlier days of the war. H.M.S. *Goatfell* has a German bomber to her credit; her Chief Engineer has been on the Clyde for 21 years, and in the *Goatfell* for eight.

Another railway steamer, the *St. Patrick*, was attacked when on passage from Rosslare,



*Ships must be cleared quickly*



a stick of bombs being dropped across the vessel. She sank in about six minutes, with the loss of 30 lives, including her Master and 18 members of the crew. The Second Engineer and Wireless Operator were awarded the M.B.E., and a Stewardess the George Medal, for bravery in assisting passengers and fellow members of the crew. All three were also awarded Lloyds War Medal for gallantry at sea.

### **Railway-Owned Ports**

The railways own and are responsible for the efficient functioning of dock, harbour and wharf accommodation at 76 places with an aggregate of 95 miles of quays.

The change over to war-work has involved many adjustments in accommodation and equipment. Inward cargoes now largely comprising foodstuffs—with huge quantities of lease-lend merchandise—and munitions of war, have in many cases taken the place of entirely different types of traffic previously handled. The exports of coal, totalling many millions of tons annually in peace-time,

and British manufactured goods of all kinds, have been replaced by shipments of military stores and such articles as landing craft, locomotives, tanks, aeroplanes, motor vehicles, guns, etc.

Port Emergency Committees, set up by the Ministry of War Transport, have functioned at the ports since hostilities started. These committees, which include representatives of the port authorities, railways, shipping, road and other interests concerned, have greatly assisted the flow of traffic through the ports by co-ordinating all efforts, determining the methods of transport and the allocation of priority to vessels and cargoes.

The docks and ports have suffered damage from time to time as a result of air raids, particularly during the latter part of 1940, when heavy raids were directed against many of them. Repairs to essential services were carried out promptly by the engineering departments. For the most part damage was confined to premises and sheds, and the operational capacity of the ports was not seriously affected.

## **CARTAGE SERVICES**

The cartage of freight and parcels is a vital part of the railway services and its usefulness has never been more apparent than in war-time.

Reductions in mileages have been obtained by keeping to a minimum types of work involving long mileages such as country lorry services, throughout road transport and motor tranship services. Traders throughout the country have co-operated in accepting less frequent deliveries. Co-operation between the railways to avoid overlapping of cartage services has yielded good results.

The effect of the introduction of a measure of austerity in this service has been that the mileage run by the railways' motors in 1942

has decreased by 16,754,072, while the total tonnage has increased by 2,350,506.

To counter-balance these economies are several factors inevitable under war-time conditions. Chief among them are the dispersal of industry and the changes in the locations of industry. Small towns and villages have become industrial centres almost overnight. Where once horses or motors were engaged chiefly in delivering goods to shops, and to private houses, greatly augmented fleets have first been carrying the materials to build the factories, and are now carrying the munitions which the factories are turning out in ever-increasing quantities.

Many intricate and exacting jobs have been





*Another essential railway service*

successfully undertaken. Among them are the conveyance of 40-ft. steel tubes over many hundreds of miles of country, of 12,000 gallon petrol tanks 30 ft. long, 9 ft. in diameter, and weighing 5 tons each, and the delivery of drums of cable along the route of underground cables.

Special cartage arrangements were made,

between the railways, to cope with "Blitz" conditions. Fleets of vehicles were earmarked to deal with traffic at alternative points in the event of damage to depots. Other vehicles were held in readiness to replace those damaged. The effectiveness of these arrangements were tested and not found wanting.

## CATERING

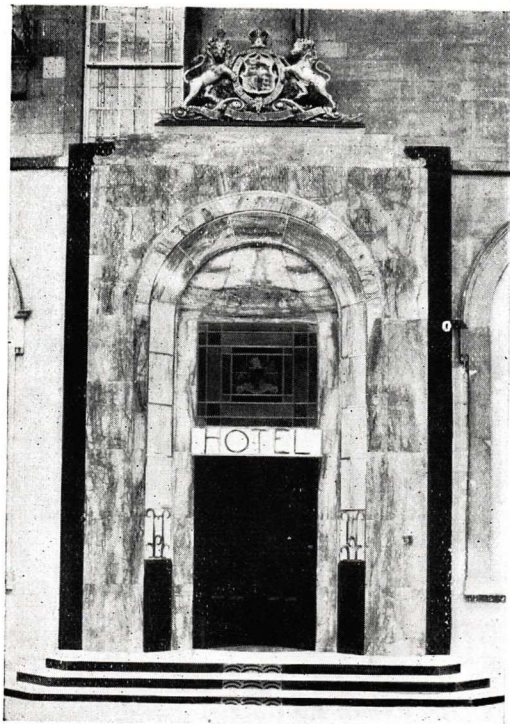
British railways own and manage 53 hotels which provide accommodation for over 8,000 guests. Sixteen other hotels are owned by the railways but not managed by them. Three hotels have been closed during the war and 14 have been requisitioned. Requisitioned hotels are being used as hospitals and as headquarters for Service departments. Twenty-three hotels have been damaged by air attack.

The 870 restaurant car services operated regularly before the war have been reduced to 65,

while the number of refreshment, dining and tea rooms has fallen from 767 to 595.

At the start of the war restaurant cars on trains were withdrawn altogether for a short period. Though they were restored, the number of services was gradually reduced, and by the end of 1941 only half—426 services—were being operated. In May, 1942, the services were reduced to 65. This drastic reduction was made to provide the maximum seating accommodation for passengers in the reduced number of trains runs. It was on the





busiest routes that accommodation was at a premium and, naturally enough, it was on these routes that the majority of the services were operating.

Food rationing and the shortage of labour and supplies have created tremendous diffi-

culties in catering for the travelling public at stations and hotels. The situation has to some extent been met by closing refreshment rooms at places where business was local and concentrating staff and equipment at busy centres.

In order further to relieve the situation, "Railbars," designed to operate with the minimum staff, and giving the maximum quick service, have been established at some 16 stations and a further 14 will follow. Snack bars have also played a part in adding to the facilities for obtaining refreshments.

Many of the kitchen and restaurant cars once used on the regular services are now doing service elsewhere. Suitably converted, they are being used in ambulance trains, and as mobile units to provide meals for dock workers, railway repair and construction gangs in districts remote from centres where food can be obtained, whilst others are marshalled in emergency breakdown trains used for dealing with air-raid damage. Other kitchen, restaurant and buffet cars serve meals to servicemen on leave trains and on troop specials.

At many stations throughout the country railway premises have been handed over at nominal rents to voluntary organisations for feeding and sleeping the troops.

## AIR SERVICES

British railways are to-day interested in sixteen air companies. They have contributed nearly three-quarters of a million pounds to the development of air transport.

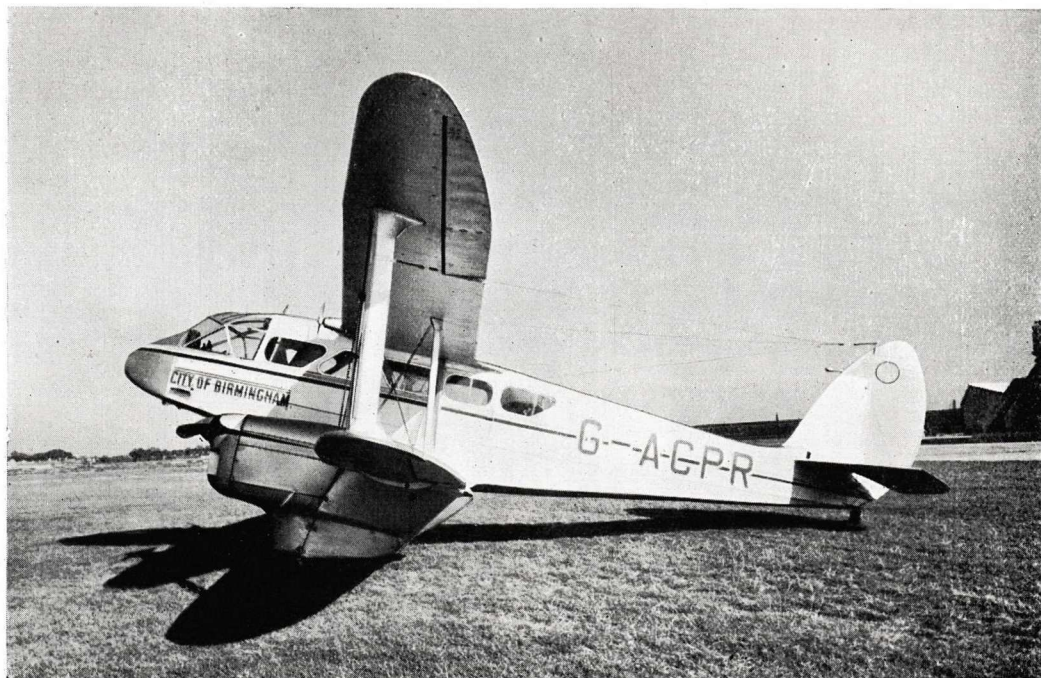
The restricted services which are permitted to-day are being operated by five only of these companies, although others are contributing aircraft, personnel and equipment.

They are:—

Railway Air Services Ltd.	Liverpool-Belfast. Glasgow-Belfast.
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Scottish Airways Ltd.	Glasgow - Western Isles and the Hebrides.
	Inverness - Orkneys - Shetlands.
Isle of Man Air Services Ltd.	Liverpool - Isle of Man.
Great Western & Southern Air Lines Ltd.	Lands End-Scilly Isles.
West Coast Air Services Ltd.	Liverpool-Dublin.





*The railways are air-minded*

Flying conditions in the early days of the war were extremely difficult and at times hazardous. With enemy aircraft operating around and over coastal areas, pilots occasionally found themselves in the middle of an aerial battle. It is a great tribute to the ability and courage of the air crews that in operations undertaken between the outbreak of war and the fall of France in June, 1940, involving a million aircraft miles, none of the aircraft was lost.

Special flights are undertaken on behalf of Government Departments, while the air ambulance, operated by Scottish Airways Ltd. to isolated islands off the Scottish coast, has given wonderful service.

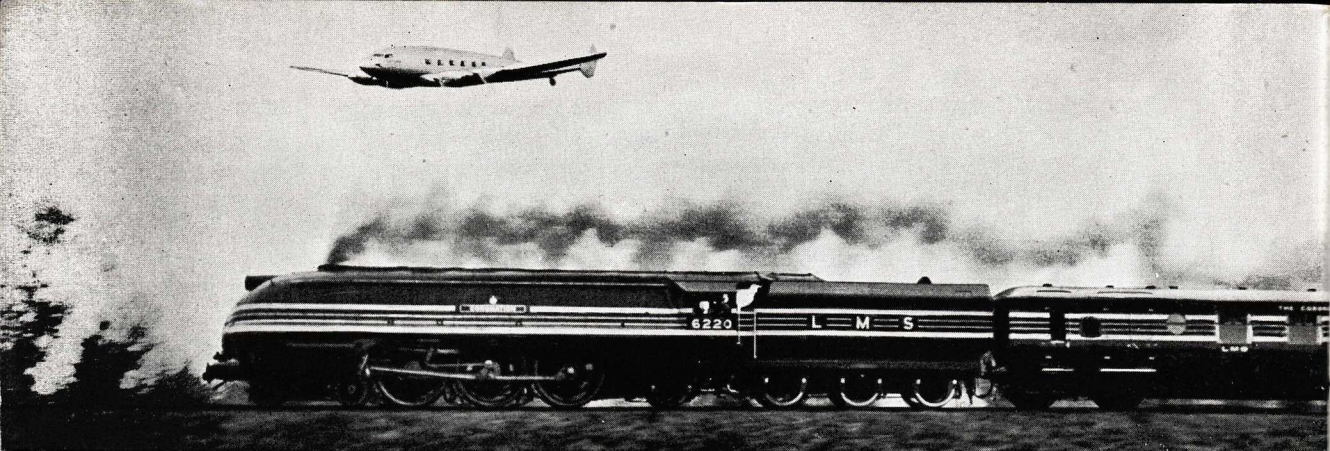
These companies, together with Air Commerce Ltd., Olley Air Service Ltd. and Western Isles Airways Ltd., form the members of a body called the Associated Airways

Joint Committee, set up to co-ordinate all the war-time activities of the group and to ensure the pooling of the whole resources of the companies to the best advantage.

Several well-known cross-channel shipping companies are associated with the railways in the development of air transport.

During the three years ended June, 1943, the companies associated with the railways have operated over 4,000,000 aircraft miles, conveyed 163,000 passengers and 4,000,000 lbs. of urgent mail and freight. Several of their pilots have over a million miles flying to their credit. Their unspectacular but efficient service in maintaining the air communications of the country under the most difficult conditions, and the work of air staffs, has been recognised by H.M. The King through the Honours Lists.





## POST WAR SERVICE

It is inevitable that when the war is over, it will take some time for the railway machine to recover from its tremendous task and dilapidation during the war. Its effort must be concentrated on war requirements until—as Mr. Bevin picturesquely puts it—“the whistle blows.” Nevertheless, the railways will at once set about restoring equipment so as to bring their services back to normal needs, and they hope also to put in train as quickly as possible new developments. The problems to be faced will not be unlike those after the last war. They can be gleaned from the descriptions of them by the Royal Commission on Transport in 1931: “Throughout the war the railway machine was driven at full speed with the minimum of attention to maintenance and repairs, and it is not surprising, therefore, that in 1919 the railways found themselves in a condition requiring a complete overhaul. The immediate problem was to make good as quickly as possible the effects on the physical assets of the forced neglect during the preceding four years. The permanent way was sadly in need of attention; there was a great shortage of locomotives and rolling stock and material had to be brought back from overseas and re-conditioned. Furthermore, re-organisation of personnel was required as railwaymen returned on demobilisation or from the Departments to which they had been loaned. But this part of the problem was relatively simple compared with the settlement

of the claims of the companies against the Government in respect of the period of control and with the ever greater question of the future of railways. To allow these questions to be determined, Government Control (which would normally have ceased immediately after the war), was retained for a further period of two years, at the end of which the Railways Act, 1921, was passed.”

### Reconstruction

Reconstruction in the senses of re-orientation and rehabilitation will be essential. The war has changed the normal flows of traffic, and many new industrial areas have been created which at present are employed on war production, but are capable of adaptation to the needs of peace. Railway transport plays so large a part in the life of the community that any reconstruction or post-war planning of cities, towns and villages must inevitably include the consideration of the transport problems which will present themselves in the post-war period.

It is the policy of the railways to look ahead, and for some time past, despite war demands, post-war planning and reconstruction has engaged their attention. The subject is not being dealt with as a domestic or parochial matter but in its widest sense, in that the closest touch is being maintained with local authorities throughout the country, in order



that new works and reorganisation schemes of the railways shall be in accord with the needs of the community. The aim is that their plans and those of the great cities and industrial areas shall march together.

Throughout the country the railways are already working with the regional planning officers of the Ministry of Town and Country Planning, and many meetings have taken place with civic authorities. For some time past an intra-railway committee has been sitting, and has assembled evidence and data upon various phases of the internal operation of railways, so that when the times arrives for new stations, goods depots, marshalling yards, or other great works to be put in hand, there will be for each an ideal arrangement, limited only in its attainment by such restricting factors as geographical considerations and other local circumstances.

The railways are vital in war, and they are just as vital in peace. The work which is now taking place will ensure that they knit in with the needs of the post-war community.

Reference has been made earlier to the altered flows of traffic, and to the many new works which have already been undertaken, finished and brought into operation, such as the doubling of lines, the installation of new marshalling yards, the reconstruction on modern lines of bombed goods stations, and other major works of a like character. But this is not the end of the story ; for when peace comes, the railways are planning to increase the already high level of efficient transportation to take their place in the

post-war world. The confidence of the British public in their railways to meet their needs will be held and enhanced.

### **Electrification**

Electric trains have already displaced steam trains for passenger purposes on 2,387 miles of main line railway in Great Britain, and the conversion has involved an expenditure of over £50,000,000. Such electrification has for the most part been carried out in the suburban areas around London, Manchester, Merseyside and Tyneside, but on the Southern Railway electric trains operate as far as Hastings, 77 miles, and Portsmouth, 87 miles from London. In a normal year electric trains of the main line railway companies run 51 million miles. The conversion of further lines for use by electric passenger trains was actively in hand in 1939, but the work is now in abeyance owing to war conditions. In the past, the natural lack of consideration of transport requirements as a whole, and the undue risk incurred in expending large capital sums on fixed plant have been the chief obstacles to electrification developments.

At present electric traction is almost wholly confined to the movement of passengers, and the traffic is conveyed in multiple-unit trains ; these are capable of being driven from either end, and the electrical equipment is mounted on the passenger coaches. On the main line railways there are 4,200 coaches equipped for these electric trains, including pullman, restaurant and buffet cars for the longer distances. The multiple-unit system is, however, not applicable to goods trains, and not





suitable for all forms of passenger traffic—more particularly main trunk line trains, the composition of which may vary from day to day and which may for a part of the journey be steam-hauled. To meet these conditions new types of powerful electric locomotives were in course of construction at the outbreak of war. One for the Southern Railway of 45,000 lbs. tractive effort has been completed, and is now at work moving trains of freight in the south of England. The L.N.E.R. have also completed one modern electric locomotive and, but for the war, this machine—and many more of similar construction—would be hauling heavy passenger and freight trains over the steeply graded line between Sheffield and Manchester.

The work on this and other electrification schemes—in suspense at the moment—will be resumed at the end of hostilities, and the railway companies in their post-war plans are considering what additional lines should be electrified. The question is an economic one; conversion to electric traction involves a large outlay in sub-stations, cables, contact conductors, electric locomotives or train equipment, depots and ancillary works. To what extent on any particular section of line will such expenditure be remunerative? That is the question that the railway companies have to determine, taking into account at the same time the improvements available as a result of recent research in steam engine design or the adoption of diesel traction.

Electrification allows extra trains to be run in the off-peak hours at much less cost than with steam traction, and it is thus possible to operate frequent and speedy train services throughout the day. In populated areas near big towns and cities such a service usually results in an increased traffic, justifying the initial outlay on electrification. Away from the cities the possibilities of securing additional revenue in this way lessens, and a long-distance main line scheme of electrification must be judged on the economies in operation likely to result. The railway companies

considered the question in the immediate pre-war period, and they are re-assessing the position in the light of conditions after the war insofar as they can now be forecast.

Various factors have to be considered—the price of coal for steam locomotives compared with the price of electric current; the greater availability of the electric locomotives compared with the steam, the cost of maintenance of electric line equipment. Electric traction shows to greater advantage on some routes than on others; where traffic is dense the overhead costs on sub-station and line equipment can be spread over a greater number of train miles; where gradients are severe the electric locomotive can put up a markedly better performance than the steam engine and add to line capacity. While it is impossible to say just what there will be in the post-war period, it is reasonably certain that some extension will be undertaken.

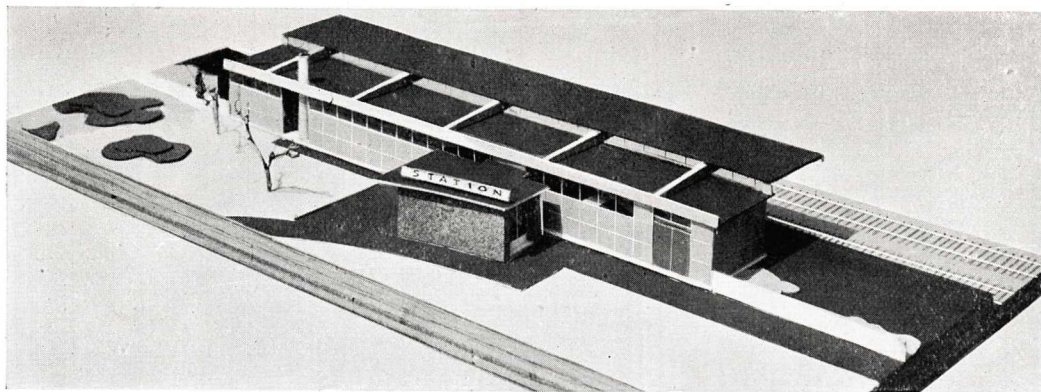
#### **Air**

The British railways of to-day are transport companies in the widest sense—taking advantage of every new development in the field of transport to enable them to provide the passenger and the trader with the most efficient co-ordinated service in the realms in which their interests lie. They and the shipping interests associated with them know the possibilities—and let it be said—the limitations of commercial air services. They have 10 years' experience in their operation, and they plan a wide expansion immediately conditions are suitable, and up-to-date airliners with a high standard of safety and comfort are available to handle the traffic which it is confidently anticipated will desire this method of transport in the post-war era. Among the air services sponsored by the railways before the war were those to Ireland, Scotland and the Channel Islands. Over-water air services show the greatest saving of time and convenience.

#### **London**

Since the end of the last war, a progressive policy has been consistently followed for the





*A future development—pre-fabricated, unit constructed stations*

development and extension of public transport facilities in the London area, resulting in a passenger transport system second to none in metropolitan cities.

It will be apparent from this record that the war has materially interfered with the plans embarked upon before the war by the Board and main line railways for the development of the London transport system, and has called a temporary halt to the continuous improvement of the transport facilities which was such a feature of pre-war days. After the war these plans must be revived, and with the relaxation of wartime controls the progressive spirit reintroduced. The precise shape of things to come, however, cannot be clearly discerned at this juncture, and it will only be possible to determine future plans when more is known of the over-riding economic and social conditions which will then prevail, and, in addition, when more is known of the schemes of planning and reconstruction to be adopted by the responsible civic authorities. It is to be hoped that the circumstances will be such as to enable the speedy completion of the extensions and developments on which work has been held in suspense during the war. These include the Central Line extensions to Ruislip and Ongar over the lines of the G.W. and L.N.E.

Railways respectively; the extension of the Northern Line from Mill Hill East to Edgware and Bushey Heath, and of the Northern City Line from Finsbury Park to Alexandra Palace, the electrification of the Metropolitan and Great Central Joint Line between Rickmansworth and Amersham, and the Chesham branch line. It is also to be hoped that, with the lifting of the black-out and the easement of wartime fuel and rubber restrictions, it will be possible, without delay, to improve and strengthen the road services which have been curtailed and to re-establish the Green Line coach system withdrawn during the war.

More than this cannot be forecast. The fulfilment of future plans depends largely upon circumstances beyond the control of the transport undertakings. One thing is certain, however, on the day that the Germans say they have had enough, another memorable instruction will go out from the railways and London Transport's headquarters to the staff at works, garages, depots and stations—to remove, as quickly as possible, all the protective fabric and black-out margins from the windows of trains, buses, trams and trolley-buses—and to "put up the lights again all over the system."



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