The Great Western Railway and Its Personnel

By H. HOLCROFT

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Administrative reorganisations at the beginning of the railway grouping period paved the way for the fullest expansion of the Great Western Railway Company in the years before the second world war. This concluding instalment deals with the active development policies which, while giving ever-improving service to passengers and traders, also earned a reasonable dividend for the ordinary stockholder. Among engineering matters, the author analyses the events leading to the decision to build the "King" class locomotives.

WHEN Pole took his seat as general manager in June, 1921, he had ahead of him two pressing tasks. The first was to restore the company to financial stability, for Government control was to end in August, and it was known that the railways were being operated at a loss, although the shareholders had received a dividend of 5¾ per cent throughout the war years and 7¼ per cent after. The outlook was not reassuring, but there was a feeling of relief that the company would regain control of its own affairs, and the officers and men were eager to show what could be done.

Sir Felix Pole, general manager from 1921 until 1929

The second task was to weld into one organisation the seven constituent and twenty-six subsidiary companies which from January 1, 1922, would constitute the enlarged Great Western Railway.

In dealing with the financial situation, the Chief Officers' Conference was the most potent instrument. It was decided to have monthly meetings of the conference at which the position of each department would be discussed. At these meetings each chief officer was to be given a target and, as a start, all items of expenditure which were more than 200 per cent above the 1913 total were to be investigated. At the same time it was decided to re-introduce canvassing for traffic, which had been in abeyance during the war, and thereby augment receipts. Excellent results followed, for not only did receipts from traffic improve, but many economies were effected and net revenue increased to such an extent that, after making full provision for renewals and depreciation, a satisfactory balance was available for the payment of dividends which were fully earned, being at the rate of 8 per cent for the years 1922 and 1923. The rate for the following three years was affected by various strikes, terminating in the General Strike of 1926.

Post-war conditions were tackled with energy with the object of increasing the efficiency, cheapness and popularity of the G.W.R., and every effort was made to restore passenger and freight services to the standard attained prior to the war. Departmental organisation was streamlined by amalgamating the accounting and audit departments under the chief accountant. This was followed by combining the surveyor's and the rates and taxes departments, and by abolishing the electrical department and transferring electrical matters, other than those pertaining to the department of the signal engineer, to the chief mechanical engineer with a view to encouraging electrification.

There was evidence of over-centralisation. For example, the distribution of rolling stock was arranged at headquarters by the superintendent of the line. No station master or local officer could make use of a wagon or coach without authority from headquarters ; the divisional traffic officers had no control over the rolling stock inspectors, who, although located at various stations throughout the line, were responsible direct to headquarters.

This was all changed, and the traffic division was made the unit for distribution of rolling stock, the superintendent of the line retaining over-riding control. At the same time, the rolling stock inspectors were transferred to the control of the respective divisional superintendents.

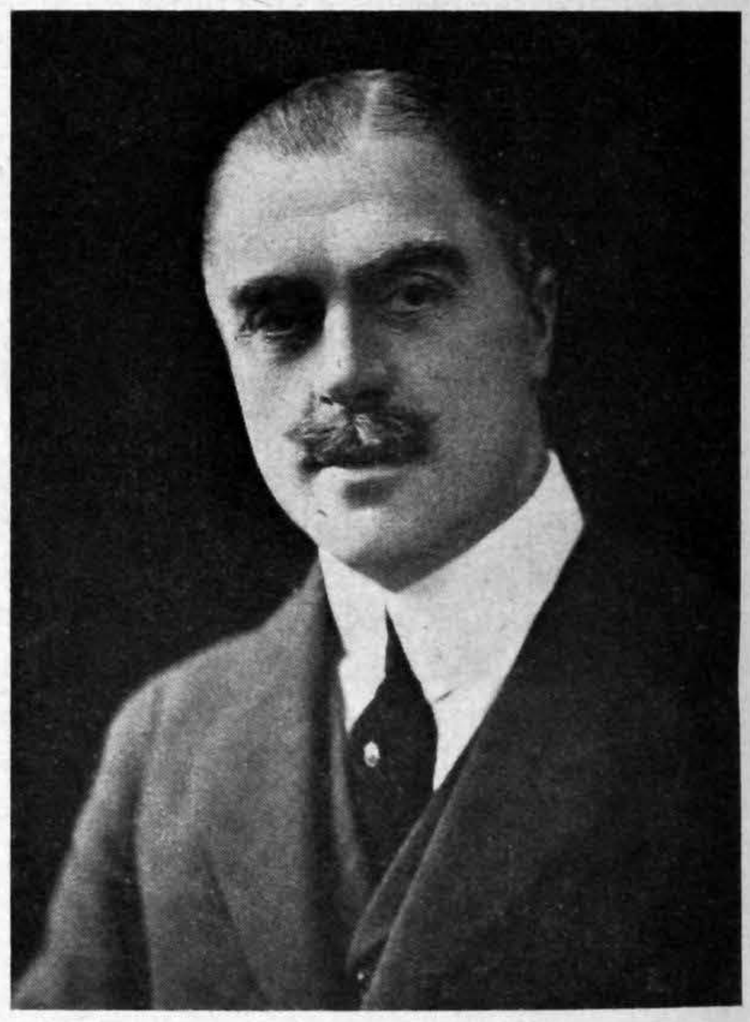
The Great Western was organised on the departmental system ; that is to say, each department was self-contained and controlled by a chief officer, under whom were divisional officers, each responsible for a considerable area of the railway. These departments had grown and developed with little regard for other departments. For instance, the division of a divisional superintendent might overlap three or four district goods managers. The respective officers were unable readily to get together with their "opposite numbers" in the other departments and this entailed wasteful correspondence and unnecessary time spent in travelling.

The general manager called a conference of chief officers, and the whole organisation was reviewed from the point of view of efficiency and economy. It was decided as a matter of principle that the areas supervised by divisional and district officers should be co-terminal, and to increase efficiency and reduce correspondence the officers in each area should meet in conference regularly.

The distribution of divisions and districts in the traffic, goods, locomotive and engineering departments were examined and a scheme formulated for their redistribution to ensure that the geographical limits of divisions were the same for all four departments. This was achieved without addition to the locomotive and engineering divisions, by allocating, where necessary, two or more divisions of one department to one of another.

Local conferences were held monthly of the traffic, goods, locomotive and engineering officers. The agenda embraced statistics of operation and expenditure, suggestions for effecting economies in operation and more economical use of rolling stock, improvement of services and facilities, new works schemes, &c.

The problem of welding together the lines amalgamated with or absorbed by the Great Western at grouping proceeded by stages. Other than on the G.W.R., the various boards of directors, general managers, secretaries and other chief officers disappeared,



Lord Churchill, chairman of the Great Western Railway Company, 1908-1933

but other officers were given posts with the new Great Western Company.

Many officers retired, for the generous scale of compensation laid down in the Railways Act was an inducement to do so, but it was quite justifiable in view of the considerable economies effected. Others not affected by this offer took the opportunity to retire, and among these was Churchward. The writer heard it said that somewhat earlier on there was some heated controversy at a meeting of a sectional board held under the conciliation scheme at which he was present. One of the trades union members tartly reminded Churchward that he was no longer master in his own house ; after a short pause Churchward exclaimed wearily, "I can see it is high time the Old Man retired !" This he did at the age of 64.

The idea of a large Great Western "family" had often been mentioned by the Chairman, Lord Churchill, and in pursuit of this ideal Pole attended as many staff functions as

possible. The *Great Western Railway Magazine* of which he was at one time editor, played an outstanding part, and, although there was no actual department devoted wholly to welfare work, much was being done by the provision of hundreds of houses in various parts of the system ; through the Social and Educational Union, the development of debating and other societies, the ambulance movement and the Helping Hand Fund.

The general manager and other officers in presenting awards were able to spread the " family gospel " and to bring home to each individual the part he had to play in promoting the well-being of the company. Direct appeal was made to every employee, by means of leaflets, in matters such as the need for each to economise in materials, stores, stationery, and so on, to the extent of 6d. a week ; at this rate an annual saving of over £100,000 would result.

A New Year's greeting and a leaflet to give information on the company's policy and activities were sent to every employee.

The general manager also attended functions of trading bodies, such as Chambers of Commerce and other trade associations. This gave an opportunity of speaking to large bodies of traders in proposing or responding to a toast and of saying something to enhance the company's reputation. The fact that on the average at that time a railway goods vehicle made one loaded journey in four days was enlarged upon and brought home to traders, and so much was done to expedite the movement of traffic.

Experience in using 20-ton four-wheeled coal wagons for the conveyance of coal for the company's locomotives was found to be advantageous and to be preferable to the use of 40-ton bogie wagons. In 1923 owners of coal wagons in South Wales were invited to introduce 20-ton wagons when making renewals. It was pointed out to them that the cost of constructing two 10-ton coal wagons was about 50 per cent more than the cost of building one 20-ton vehicle. In addition, the need for more siding accommodation at the collieries would be obviated, while the cost of repairs to wagons and sidings would be reduced.

As there were over 100,000 private owners' coal wagons in South Wales, mostly of 10-ton capacity, it was obvious that the introduction of 20-ton wagons would effect a very large saving on the annual cost of renewals, although it was recognised that some difficulties would have to be overcome at the collieries and at the docks. The company offered to allow a rebate of 5 per cent off their rates in respect of coal class traffic conveyed wholly over their system in fully loaded 20-ton wagons, notwithstanding that railway operating economies would not accrue until a considerable number of high-capacity wagons were in use. Considerable progress was made in the course of the next few years and, as a further inducement, dock charges for the shipment of coal conveyed in fully loaded 20-ton wagons were reduced.

Delays to freight sometimes occurred and occasionally annoyance was caused to traders when consignments did not arrive within a reasonable time. Pole proposed a scheme, based on the Post Office registered letter system but designed to meet the wishes of traders, whereby they would be advised when any particular consignment was delivered, especially in the case of goods for shipment. It was proposed that on payment of a fee the railway company should undertake to watch the movement of particular consignments throughout the journey and guarantee to deliver by a specified time. The scheme was submitted to the Railway Clearing House, but various objections were raised, so the Great Western went on with the scheme as far as its own system was concerned. It proved very popular and in the course of time the other railways adopted it under the slogan " Register under the Green Arrow."

Elias Ford, the goods manager, was most energetic in evolving ideas for improving goods services. As regards ordinary deliveries, his aim was to convey all consignments in one day, and this was made evident to the public by slogans such as " One Day Transit to all Points," painted in large letters on the roofs of goods stations. He was also an enthusiastic advocate of what became known as the " railhead method of distribution," which was the establishment by large firms of a stores depot at central stations for retail deliveries to be made by the G.W.R. as agent for the company concerned. Many well-known firms made extensive use of this system.

Combined rail and road services were gradually extended and arrangements

C. B. Collett, Churchward's successor as chief mechanical engineer in 1922

developed to collect and deliver goods traffic within a radius of 15 miles from certain stations.

Charles Aldington, as superintendent of the line, had been a keen advocate of longer coaches, and some of these were 72ft in length. On relinquishing his post as general manager, he urged Pole not only to continue to favour long coaches, but to introduce even longer ones. C. B. Collett, who became chief mechanical engineer in January, 1922, was against this, as he felt the limit of safety had been reached as regards buffer locking on sharp curves. He thought it better to reduce the length of new coaches to less than 70ft, and this was agreed to.

In his efforts to improve rolling stock, Collett carried out some research. There were seven different types of bogie in use, so he arranged for a train of seven coaches to be assembled representing all the different types of bogie. This train was run at high speed, and it was found that, while certain of the coaches were comfortable, others were unsteady and even alarmingly so.

Pursuing the experiment, Collett arranged for the lavatory tanks of the seven coaches to be filled, each with a wash of a different colour. An observer was stationed in each lavatory with instructions to release some wash whenever a bad lurch was felt. If only one or two observers felt a bump it might be assumed that the coach was at fault, but when all the observers did so, and the section of track looked like a rainbow, it pointed to defective permanent way, such as places where sleepers were defective or the packing needed attention. This " whitewash " train became a regular feature of permanent way examination.

In order to observe a bogie in motion, part of the floor of the guard's van was removed. While this helped in developing a new bogie, the defeaning noise at speed also indicated that to ensure comfort of passengers the floor of all coaches needed to be insulated and made as sound-proof as possible.

In due course Collett produced a standard bogie intended to replace all other types ultimately. It was known that in order to run steadily, coaches having similar bogies should be together as far as possible. In order to make the new bogies apparent to shunters and others when assembling trains, a clear indication was given by painting the axleboxes blue.

On becoming chief mechanical engineer in 1922, Collett had refused to move into " Newburn," the official residence, having an aversion to the place, and so Churchward continued to occupy it until his tragic death in 1933. After that, the building was demolished and additional sidings laid over the site where this noted house and its grounds had been.

Collett faithfully carried on Churchward's locomotive standards and practice and enlarged upon them. As the civil engineer had refused to accept the " Star " class (four-cylinder 4–6–0) for running if provided with Churchward's No. 7 boiler, on account of excessive weight, Collett set about designing his No. 8 boiler, intermediate in size between Nos. 1 and 7. By doing so, he was able to mount it on an enlargement of the " Star " class chassis, and to keep the weight imposed by each pair of coupled wheels below 20 tons as desired by the civil engineer. The resultant locomotive, the famous " Castle " class, which first appeared in 1923, was outstanding in its performance for speed and haulage, and brought much prestige to the G.W.R. Batches of these engines were built at intervals over the next twenty-five years, and their construction only ceased with nationalisation.

As the " Castle " could easily deal with any train that could be accommodated in the length of platforms at Paddington as they stood at that time, it came as a surprise when an even larger four-cylinder engine, the " King " class, made its appearance in 1927. There seemed to be no very convincing reason for its creation only four years after the " Castle." The events leading up to it and the circumstances in which a decision was made to go ahead are dealt with in *Pole's Book* in the chapter headed " Birth of the King George V Locomotive."

(It may be interposed here that Pole was knighted by H.M. King George V, his name being included in the Dissolution Honours List of 1924. Hereafter he is referred to as Sir Felix.)

It was one of the directors, Sir Aubrey Brocklebank, chairman of the locomotive committee of the board, whose knowledge of locomotive practice was considerable, who in the course of conversation with Sir Felix indicated " that locomotives of the ' Castle ' class were not entirely satisfactory." Apparently this referred to their limitation in

axle loading, the maximum permissible at that time being 19½ tons, and full advantage had been taken of this in the design of the "Castle." They discussed the point with Collett, who lamented the fact that, compared with axle loadings in America, British locomotive practice was badly hampered, and he added that if he could work to an axle load of 22½ tons he could produce a very fine locomotive !

Sir Aubrey then discussed various limiting factors in railway affairs and he contended that the rails, if adequately supported, could carry almost any weight and so the difficulty must be in the bridges ; and he asked if a diagram could be prepared to show the maximum axle load for each bridge. At this, Lloyd, the then chief (civil) engineer, was invited to join in the discussion and he readily agreed to have the diagram prepared. When asked what axle load he provided for in designing new bridges, he replied 22 tons, which caused some astonishment, especially as it transpired that it had been standard practice for over twenty-two years, having been recommended to the engineering committee by Sir James Inglis when chief engineer.

On inquiry whether the original calculation had a sufficient factor of safety to permit 22½ tons axle loading, Lloyd assented, and he estimated that there could only be a few bridges on the main line that had not been renewed in comparatively recent years. Upon this, Sir Felix turned to Collett and said : "You can build a new locomotive having an axle load of 22½ tons and we will have it for the summer traffic of next year." To Lloyd he said, "You must have the line from London to Plymouth ready for the new locomotive." In giving these instructions, Sir Felix must have felt confident that the board would endorse his action.

Upon investigation it was found that only some four bridges had to be reconstructed, the largest being over the River Kennet at Reading. Thus it came about that in July, 1927, the birth of "King George V" was announced. It had a maximum tractive effort of over 40,000 lb, which was considerably greater than any other British passenger locomotive.

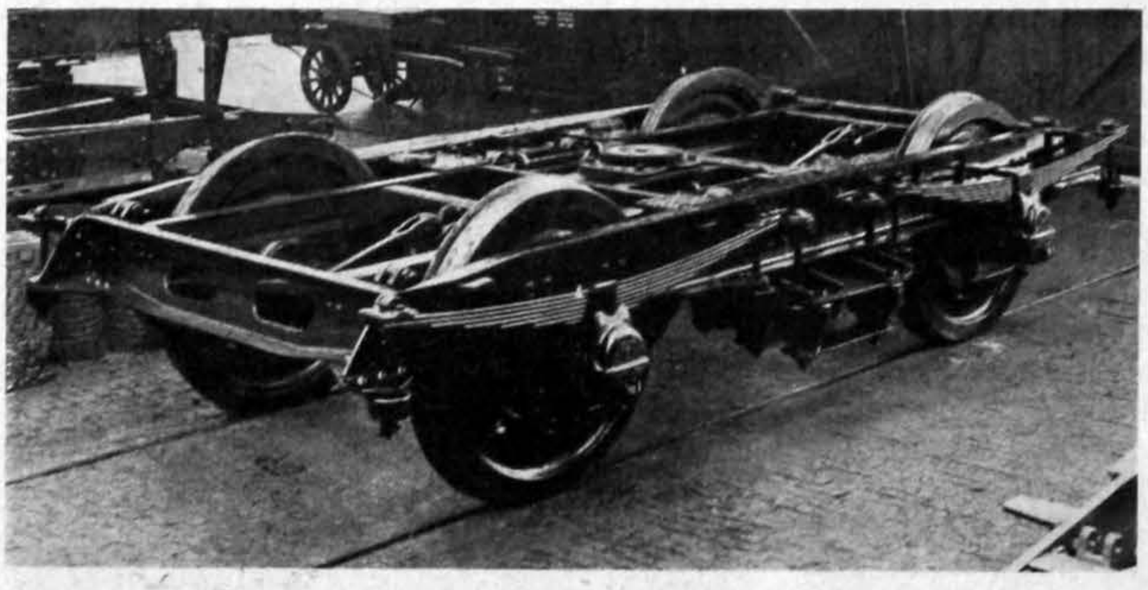
Sir Felix went on to say that a critic of railway management might well comment on the fact that neither the general manager nor the chief mechanical engineer knew that for twenty-two years bridges were being designed to enable heavier loads to be carried. This was quite in keeping with the highly departmentalised state of affairs that existed at Paddington, and there was little doubt that the then general manager and the superintendent of the line were not even aware of what the directors had authorised as the basis for future engineering practice !

Railway engineers, both mechanical and civil, will recognise that the account as related in *Pole's Book* is an over-simplification of a very complex problem and that it represents less than half the story.

The Railway Engineers Association, which included all the civil engineers on railways in Great Britain, had its counterpart in the Association of Railway Locomotive Engineers. These two bodies could discuss points of common interest, and one of the results of such collaboration was the adoption of a standard tyre profile to supersede the many variations in use. The R.E.A. load curve of 1908, which showed a maximum axle load of 22 tons, was well known to the A.R.L.E., as well as the later one of 1920, which also permitted 22 tons. This maximum, however, represented a rolling load upon the underbridge and a margin had to be allowed for various dynamic loadings, in particular the hammer blows set up by the revolution of coupled wheels of locomotives at speed. In order to safeguard his structures, the civil engineer on the Great Western had hitherto restricted the weights on coupled wheels of locomotives to 19½ tons.

Churchward's Pacific type "The Great Bear," of 1908, had 20 tons on each of the coupled wheels, but its running was restricted to the main line between Paddington and Bristol. His proposal to mount his No. 7 boiler on the "Star" class was refused, while Collett had to keep to 19½ tons for his "Castle," although all three of these classes were four-cylinder engines.

This rigid attitude had long been maintained by the chief engineers and yet only three years after the "Castle" had appeared Lloyd seemed to accept without demur a loading of 22½ tons. No wonder Collett was astonished !



Collett's 9ft standard pressed steel bogie for passenger coaches

It may well be asked what it was that caused this change of attitude and the reason for Sir Aubrey Brocklebank's inquiries into axle loading. The writer submits that it was the appearance on the Southern Railway of the four-cylinder 4–6–0 type engine "Lord Nelson" in the summer of 1926. Not only had this engine more nominal tractive effort and a boiler with a larger grate area than the "Castle," but the weight carried by each pair of coupled wheels was close upon 21 tons. The chief mechanical engineer of that railway held the view that the very light or even negligible hammer blow in multi-cylinder engines merited some increase in static loading as compared with that of engines having two outside cylinders. This view was strongly pressed with the civil engineer with the result that an increase of 10 per cent was permitted for multi-cylinder engines above the 20 tons limit in the case of two-cylinder engines.

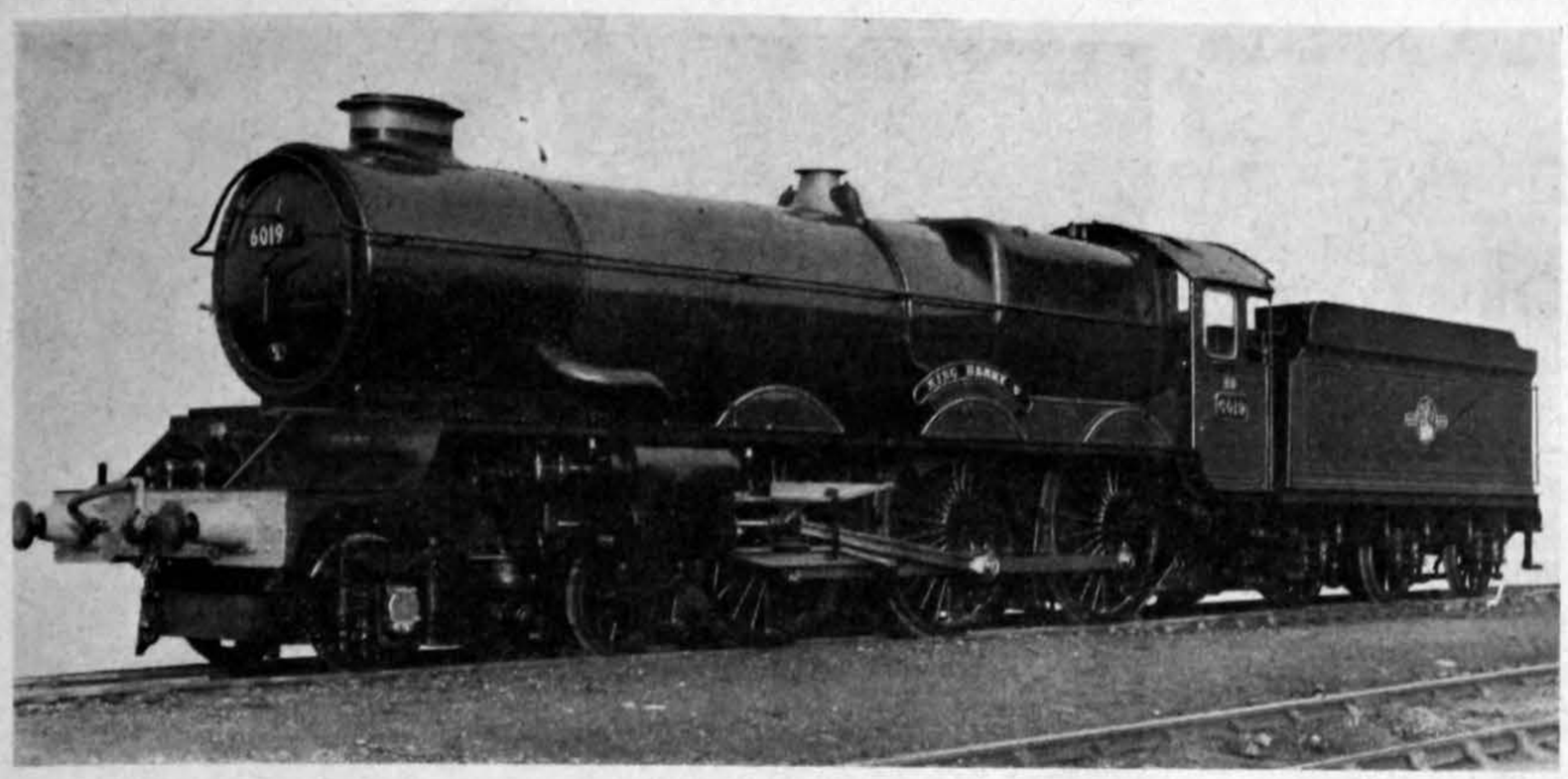
No doubt Sir Aubrey thought that if the Southern Railway could allow such loading, the Great Western should at least equal, or even exceed it, hence his inquiries into axle loadings. It is possible that he had some preliminary talks with the parties interested to pave the way before approaching the general manager on the subject. The outcome of it all was that, according to his account, Sir Felix gave instructions out of hand for the building of a new locomotive having axle loadings of 22½ tons and the immediate renewal of any bridges incapable of carrying it. It should be noted, however, that the concession over axle loading only applied in the case of a four-cylinder engine.

Not only was the "Castle" outstanding in its performance on the Great Western, but in the interchange of locomotives in the trials of 1925 an engine of this class showed to advantage against Gresley's Pacific type on the London and North Eastern Railway. In the summer of 1926 a locomotive of the "Castle" class was lent to the London Midland and Scottish Railway for trials between Euston and Carlisle. This engine handled with ease trains which were causing the L.M.S.R. engines to lose time or need double-heading.

It may well be asked why, in view of all this, it was so urgently necessary to build the "King." The writer suggests that it was largely a matter of prestige, for the fifteen years' lead over other railways which Churchward had established in 1911 had been overtaken and something drastic was needed to regain the lead. No sooner had the first of the class, "King George V," run its trials than it was shipped to the United States to take part in the centenary celebrations of the Baltimore and Ohio Railroad in a blaze of publicity.

The only routes available to the "Kings" were Paddington to Plymouth, and Paddington to Wolverhampton via Bicester, and

A "Castle" class locomotive as running to-day with double-blastpipe chimney



Like the "Castles," the "Kings" have been equipped with double-blastpipe chimneys but otherwise are little altered in appearance

no more than thirty of this class were built. After that, the building of "Castles" was resumed and continued for another twenty years.

Collett did not continue with the building of Churchward's "Saint" class, two-cylinder 4–6–0 type with 6ft 8½in wheels for express work. Instead, he altered the design by adopting 6ft wheels, so creating a general utility engine which proved to be highly successful. This was followed by a similar engine with 5ft 8in wheels for fast freight trains, the "Grange" class, also having a large route availability. To cover the remainder of the system, the lighter "Manor" engine of the same type was produced.

The Cambrian Railway, taken over at the grouping, presented a problem, for conditions were very similar to those prevailing in Devon and Cornwall after the disappearance of the broad gauge. Collett solved this problem by re-constituting from existing engines Dean's "Duke of Cornwall" class of 1895, which had done so well there, for use in another field. This 4–4–0 class carried on until the "Manor" class came to supersede it.

Sir Felix Pole had long felt the need for an authentic history of the Great Western and the opportunity came during conversation with a Great Western enthusiast, E. T. McDermot, a barrister by profession. He indicated that he would gladly accept a commission to write such a history. His offer was accepted and the directors gave him access to the records of the company. He had a free hand to state the plain unvarnished truth, without fear or favour.

It was in the autumn of 1928 that Sir Guy Granet, in the course of conversation, asked Sir Felix whether he had ever thought of leaving the Great Western, to which he replied that he had not and would never do so. Sir Guy said that he left the Midland Railway and had not regretted doing so. He went on to say that a new electrical company had been formed for which a whole-time chairman was needed, and that Sir Felix might at least have a chat about it.

This matter having been broached, Sir Felix received a call from one of those who had formed the new company, but as little was said on this occasion it seemed as if it were the end of the matter. This was not the case, for friends of Sir Felix interested in the new company pressed him to make the change. In due course he told the chairman, Lord Churchill, what had been offered and said he would refuse it if the chairman wished him to do so, but there was something to be said for acceptance as it would give Milne, the assistant general manager, his chance.

In July, 1929, Sir Felix took up his work as chairman of Associated Electrical Industries, Ltd., and James Milne was appointed general manager of the G.W.R. They had been friends for some twenty years and in recent times their association had been rather in the nature of a partnership than that of chief and assistant. Sir Felix could, therefore, hand over the reins of office to him confident that he would handle them skilfully and well, and that he would ably maintain Great Western traditions.

At fifty-two years of age, Sir Felix had the prospect of many years ahead of activities in new fields. His departure gave Milne (later Sir James Milne) his chance to move up; there was only some five years between their ages.

The Great Western Railway Company had by this time expanded to its fullest extent; the organisation had been overhauled and streamlined and was in the position to give the passenger and trader ever-improving service and facilities, while earning for the ordinary stockholder a reasonable dividend. This continued until the autumn of 1939, when the second world war broke out and the Railway Executive Committee once more took over control.

This arrangement lasted for nearly six years, and at its end a Socialist government came to power with State ownership as its policy. The plan to nationalise the railways was not long in coming, and as the New Year of 1948 was ushered in the great company came to its end.

The Parking Problem

(Contributed)

In this article further reference is made to the Traffic Engineering Study Group's discussion on "Parking" at the Institution of Civil Engineers on March 29, about which we published a report last week.

The problem of providing parking space at places of work, for the employees' own vehicles, was raised by a speaker, who told of a recent survey covering thirty firms, in different parts of the country, employing from sixty to 4500 persons, the average being 450. At these firms' premises the overall ratio of personal vehicles to employees worked out at: bicycles, one in five and a half; cars, one in twelve; motor-cycles, one in twenty-three; motor-cycles with sidecars, one in 170. Already more than 60 per cent of the firms were embarrassed to find space for parking on that scale; but the demand is increasing. The point was made that industrial parking is fast becoming as essential an amenity as the works canteen.

Two aspects of the problem of parking or garaging in residential areas were raised during the discussion. The first concerned council housing estates, where visibly the motor vehicle population is increasing as rapidly as elsewhere. In existing estates it would often be impossible to find sites for the construction of parks without resorting to demolition, which would be a very extreme measure. The other type of area to come under discussion was exemplified by a sector of West Central London, comprising approximately a dozen square miles with resident population 355,000 persons and more than 50,000 motor vehicles. The parking problem is spreading outwards through such near-central districts. In considering the commuter car parking problem it is important not to overlook the existence of an often large, and always increasing, resident vehicle population; the sum total of central and near-central urban space devoted to the stationary motor vehicle can reach a high proportion of the whole—far too high for a recognisably British city—when both car-owning and car-commuting become general—witness Detroit. That prospect led one speaker to mention the rush-hour "exhaust fog" of Los Angeles, and to admit that there might be advantages in the moving of some of the work places out from our cities. Another speaker thought it important to preserve a balance between private and public transport.

The subject was parking; there was plenty to be said on it, and the discussion was quickly piloted back to it whenever necessary. However, since the decline of public transport is concomitant with the parking problem, it was not altogether irrelevant that certain other speakers also touched on the subject of public transport. There was a reminder that 93 per cent of the daily passenger traffic into and out of London is still by public transport. One speaker suggested that a pair of ring roads—the outer one principally for cars, the inner one for buses—could result in a much improved bus service, justifying a considerable increase in the use of "No Waiting" orders in the centre. Against this the view seemed to predominate that public transport should "set its house in order" if it could; but meanwhile, and for the foreseeable future, this is the motor car age.

It remains to record one speaker's distinctive contribution on the nature of the problem. He reminded the meeting that traffic engineers are not as other engineers in the problems they meet; it is not the forces of Nature alone with which they have to contend, but also those of human nature; Nature conforms, humans do not. This particular problem of parking is very typical of traffic engineering in that respect. It is, moreover, typical of the conflicts to which inventions and new developments give rise. These conflicts are either allowed to resolve themselves the hard way, in the field of economics, which in this instance might result in parking becoming altogether too expensive to be afforded by the general run of present-day car owners; or else the conflicts are resolved by the Government of the day by means of legislation that inevitably involves some curtailment of freedom and diversion of resources.

Another speaker averred that current reduction in vehicle usage is not by will of the users, nor for lack of personal spending power; it is due to lack of highways, including parking space.