RAILWAY OPERATING IN FRANCE.

Paper read before the Institution by L. S. SIMPSON, Member, Alta Cordoba, on 16th June, 1922, at Alta Cordoba.

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Although it is now seven years since I left to take a very small part in the Great War, and events that occurred then are gradually becoming ancient history, I was asked by the Chairman of the South American Centre to read a Paper on Railway Operating in France, with special reference to the Train Ferries.

I am sure we all regret that he is not with us to-day, and I feel that he has basely deserted you after having made arrangements for me to bore you for an hour; however, I am taking advantage of his absence on leave by saying very little about Railway Operating, less about the Train Ferries.

As both these subjects as well as construction engineering have already been written about, I propose telling you something about the mechanical engineering side, and I hope you will not be too disappointed.

Owing to our not having been allowed to take photographs during the war, I have only a few reproductions of official pictures that have already appeared in the technical press, and one or two that have been produced by a member of my staff from photos and copies of plans of works.

As in speaking of events spread over some four years one is apt to wander from the main line, which in this case I have taken as my own experiences, I have felt obliged to read the notes I have set down, both to avoid boring you with too much detail and also to economise time.

These notes are made up partly from memory and partly from rough diaries I kept, and some of the photographs are copied from official ones that appeared in the very excellent war number of the "Railway Gazette," to which I must refer you for many interesting particulars of the train ferries.

That I left here on May 3rd, 1915, landed in Liverpool on the 25th, was interviewed by the War Office the next day, gazetted Captain on June 7th, has not much to do with the story, but it brings me to June 8th, when I joined the Royal Engineers at Longmoor Camp.

Longmoor, situated five miles from Borden Station on the L. & S.W.Rly., was practically the beginning and the end of the railway work of the war. Before the war it was the headquarters of five R.E. companies—two regular, the 8th and 10th; and three special reserve, the Monmouths and Angleseas. These five companies were mobilised on 4th August, 1914, and the 8th Company left for France; Lieut.-Colonel Twiss, R.E., who was in command, being sent to France as Director of Railways under the Quarter-master-General.

At the end of December, 1914, the depot was considerably enlarged, and in January, 1915, the first of the Inland Water Transport troops were assembled. In April the Railway Operating Division was first formed to operate railways overseas, followed in June by the C.O.R.C.C., consisting of 20 officers, 500 men and 650 tons of material.

Originally made up in sections of 266 men and no specific number of officers, the R.O.D., in January, 1917, came under the organisation of Sir Eric Geddes, the Director-General of Transport, when the mechanical side was made into a separate department and the remainder expanded into a variety of companies, consisting of three officers and 250 men, whose occupations are well described by their titles:—

Broad Gauge and Light Railways;
Operating Companies;
Workshops Companies;
Miscellaneous Trades Companies;
Transportation Stores Companies; and
Electrical Sections.

I was but five days at Longmoor, busy days and nights when I tried to acquire as much military engineering knowledge as possible, including some kind of working acquaintance with the office and book-keeping side, etc.

At the end of the week orders came from the War Office for me to proceed overseas with the first 30 R.O.D. men, and although we were all somewhat inexperienced, we managed to march from Waterloo to Victoria without interfering with the traffic to any great extent, and landed in Boulogne in the evening of the 12th June, reporting at once to Major Wedgwood, now the General Manager of the North Eastern Railway.

The next day we travelled by ordinary passenger train to a small station, Pont d'Ardres, a few miles outside Calais, on the line to Hazebrouck and Lille, where we were met by two officers who had arrived that day and had taken up their quarters in a beet sugar factory, one of the many that are dotted about the Pas de Calais, where our first work was to be the cleaning, repairing and preparation of 35 Belgian locomotives for working the Hazebrouck-Ypres line.

The sugar factories are particularly interesting, the one we were in employing about 1,000 men in the busy season, which lasts from September to January or February, according to the size of the crop, but only maintaining a small staff of foremen and regular fitters for repairing the machinery during the off-season. The capacity of the factory was roughly 45 20-ton wagons of raw sugar per day.

Very soon after our arrival, the O.C./R.O.D., Colonel Cecil Paget, whom you have all heard of as General Superintendent of the Midland Railway, came over from his headquarters' train, then at Calais, and explained that the authorities wished us to relieve the French Engineers (7ieme genie) who were then working the Hazebrouck-Ypres line, the doubling of which was just being completed, and take over from July 15th; and that the 35 engines, which we found waiting for us and which were in a terrible state owing to their not having been touched since they were rescued from Belgium, were the first consignment of a large number that had been promised by the Belgian Railway authorities.

To help us with our work of repairing these 35 engines, all of the ordinary Belgian passenger type, we had five or six machines which the O.C. had begged, borrowed or stolen from his own railway at home, which we put down temporarily on sleepers on the ground and drove with a motor supplied by power from the sugar factory, later on transferring them to some 45-ton flat wagons which we turned into portable shops as soon as we received a petrol engine and dynamo, which did its best to give all of us a black eye the first time of starting.

More men came and more engines, and during the next few months, *i.e.*, until 24th August, I was partly occupied at Pont d'Ardres, but most of the time working with the O.C. at Calais on plans for the future, taking drivers to learn the road, interviewing French and Belgian railway and military engineers.

Owing to the sugar factory requiring us to move out so that they could commence sugar-making early in

September, we were obliged to find some other place where the work of repairing engines could go on, and the only spot available was an ancient chalk pit and line graded 1 in 80, leading to a quarry situated at Caffiers Station, on the main line between Calais and Boulogne, at the top of the long climb out of Calais, 11 kilometres of 1 in 200 that many of you probably remember when going from London to Paris.

A move was made at the end of August, and the detachment, growing all the time, remained there till December.

Headquarters R.O.D. moved here September 11th-16th, when O.C. left for Boulogne, to rearrange the working in the port.

In the early days of the war Colonel Paget had been consulted as to the improvements to be made in the yards and sidings in that part of Boulogne Harbour called the Bassin Loubet, and as by September the traffic had increased to an extent that indicated that congestion was likely to occur, he was ordered there to rearrange the working.

How the supply business increased, not at Boulogne alone, may be realised when it is stated that the Army grew from 6 to 60 Divisions (2,700,000 men), and that a division requires some 200 tons of deadweight stores, and that the addition of one ounce to a man's rations means 75 tons of goods.

After careful study of the probable requirements, Colonel Paget produced a scheme of working that held good for the whole war.

We were told that ammunition, which then did not exceed 600 tons per day, would not be likely to exceed 1,500 —but before we left, in December, we had reached 1,600 tons, and early in January the total daily amount touched 2,300 tons.

I have no further figures of our own requirements in ammunition, but it is interesting to mention that the Germans fired at Verdun 1,350,000 tons of shell, which required some 135,000 railway wagons to carry them.

During the three months that the Headquarters R.O.D. was at Boulogne we were kept very busy in other directions. In September all the available men and engines from Caffiers were hurried to Armentieres, to be ready for what was then hoped would be a 30-mile advance, but alas! it did not come off, and the whole outfit was moved to the Nord running shed at Hazebrouck, where we took over the working of the Hazebrouck-Ypres line on 1st November.

I cannot take up your time with a dissertation on the French railway organisation, but those of you that are interested will find a great deal about it in back numbers of the technical press. Suffice it to say that plans worked out in peace time proved to be correct, and the change over from peace to war organisation worked perfectly smoothly.

The French railwaymen were wonderful. Some of the Nord engines used to come into our depots, and we watered and coaled them and looked after the engines while the men slept. Many of their drivers never left their engines for a week, and when they did come in they generally fell asleep as soon as they saw our men climb up on to the footplate.

Colonel Paget, with his precise knowledge of the French language and unrivalled skill in railway operating and organisation, had no difficulty in working in with the French or in carrying out the orders of higher authority, often involving complicated movements of men and materials, and it is entirely due to him that the Railway Operating Division took such a large and important part in contributing to the success of our arms. Both on the operating and the mechanical side we came to be regarded as a seventh Railway Company, and our relations with the French staff and the officials of the State and five private companies were always most cordial.

In September, 1915, D.R.T., when in Boulogne, said that 2,500 wagons ordered from Canada in April were likely to arrive very shortly, and arrangements for erecting had to be made. The authorities had picked out a 20-ton Belgian covered wagon and a Nord 20-ton wagon as being suitable, obtained drawings and specifications from the two countries, and placed orders for 1,200 of the former with the Canadian Car and Foundry Co., and 1,200 of the latter with the National Steel Car Co., Hamilton, Canada, and in addition 100 from the latter firm with guerites. As the O.C. was exceptionally busy at Boulogne at this time, he deputed me to undertake the necessary arrangements, and with D.R.T.'s sanction I visited various places, both near Dunkerque and on the main line between that place and Boulogne, and eventually fixed on some land at Audruicq, 25 kilometres from Calais and about the same distance from St. Omer, where the Stores Department had already a small depot. One's choice was limited, as it was necessary to choose a site where the ground was level and where there was plenty of room for expansion (see Fig. 1).

In consultation with the Chief Constructing Engineer, Colonel Waghorn, a regular R.E. and also the Agent for the N.W.R., India, plans were agreed, and work on the first three sections commenced on 12th October.

These were ready by 16th November, and at the same time a locomotive yard was started, the tracks being completed by 8th December, on which date the second move of the R.O.D. was made from Caffiers to Audruicq, the O.C. and his headquarters moving to Hazebrouck.

Both men and materials were scarce at this time, but 12 men, with a certain amount of wagon experience, and one clerk were found among the staff at Boulogne and moved to Audruicq, and with these a small beginning was made, putting down flooring, collecting piping for air and water lines, and unpacking and erecting a few small cranes.

Directly the wagon erection proposal was put forward I had been sent to England to obtain plant, and with the assistance of the War Office and personal acquaintance with many Railway Mechanical Engineers I was only able to obtain on hire one 5-ton crane from my old Railway Company's wagon works, and that because having managed those works for three years I knew the crane could be spared, and had the C.M.E. rather at a disadvantage. It is only fair to say that all the Railway Companies gave us all that they could spare, but in those days no one, not even we ourselves, quite realised how big the job was going to be. I returned then to France, after three days' rather hopeless search, with one crane and the promise of a few tools.

A few 2-ton and 3-ton cranes were heard of in a field on the Midland Railway. When they arrived they looked as if they had been " in " the field. Although preliminary specifications gave $4\frac{1}{4}$ tons, the heaviest lift eventually turned out to be $8\frac{1}{2}$ tons, and we were fortunate in getting hold of a Brown-Hoist 10-ton crane in France. This crane worked practically day and night for five months, stopping on Sundays for wash-out. When it was away for ten days a 15-ton crane which was lent us couldn't reach the cases put down by the other, and skids had to be built in a hurry across the yard to enable cases it could reach to be brought to the work. The difference between the two cranes was two cars per day.

At the end of December 109 A.S.C. men arrived. These comprised trimmers, shunters, signalmen, porters and clerks. Not exactly the men one would have chosen for wagon erecting or even for preparing the ground, but they all turned out to be very adaptable, and were an excel-

lent set of men, and most of them remained in responsible positions until the end.

The first four Canadian Car and Foundry cars arrived without wheels in January, but as regular shipments did not come for some time, the men were employed assisting other units—making alterations to miscellaneous wagons that came from England, refrigerator vans, G.N. and G.E. coal wagons, collecting and installing such plant as could be found.

A great deal of my own time was spent with and for the O.C. going round out-stations—Candas, Amiens, Hazebrouck—looking after construction engineers, engines, etc., and on more than one occasion I had to visit the headquarters of the Belgian Railway Administration at Havre to try and persuade them to lend us their engines.

At that time the engines were dotted about the railways of France, and deteriorating rapidly, but the Belgians had a project for collecting them all together at Oissel, near Rouen, and were afraid that if they lent them to us and there was an advance into Germany, they would have none left to work their civil traffic with, and so the most we could obtain was 250, and it was a long time before we got all those.

We literally started wagon erection at Audruicq in a beetroot field with a motor-car spanner—tools were very difficult to obtain in sufficient quantities, and anyone coming over from England was asked to bring what he could in his kit. The O.C. even brought us some reamers in his despatch case. Many were the trials and troubles of these early days, but we managed to get through without any undue delay, and the first train of 49 (one short of 50 on account of the French Inspector not being satisfied with some inscription on a wagon) left for Darnetal, near Rouen, on 4th April. The 8th May saw the erection well on the way, and as on the 19th plans for the new yard were first discussed, it will be as well if I now describe the general lay-out.

The General was promised the wagons at the rate of 120 per week, and I am glad to say that rate was exceeded once regular deliveries started.

The second contract was for 300 per week, and as long as they came fast enough we turned out that number.

Average for the best 10 weeks	...	300
,, ,, ,, 20 ,,	...	255
,, ,, whole time	...	130

The capacity of Audruicq when in full swing was:—

Erection of new cars	... ...	300 per week.
Heavy repairs of wagons	... ...	150 ,, ,,
Light ,, ,, ,,	... ...	200 ,, ,,
General repairs, ambulance trains	...	1 ,, ,,

A museum of compressors aptly describes the weird collection we had to do the work with in the early days, and when I say that later on we were erecting 60 cars per day—660 rivets per car, or nearly 40,000 rivets per day—you can imagine we wanted " some " air.

At the start we had an ex-steam-driven vertical compressor coupled to an old Daimler motor-car engine, a steam-driven horizontal on truck, a petrol-driven horizontal on truck, four Westinghouse brake pumps; total capacity barely enough for running two tracks of ten cars per day each. Later on we had one 300 cu. ft. steam-driven compressor, one 750 cu. ft. Alley McLellan compressor, two 1,750 cu. ft. ditto.

In 1917 we had 28 cranes of eleven different makes, ranging from 2-20 tons, at work—eleven on erecting, one landing empty packing cases and scrap wood, the remainder on repairs, buildings, etc. I may mention here that with the exception of some very small stuff left over at the end, all the packing cases were used, the big stuff for sheeting buildings, the smaller for manufacturing purposes in the shops and for lighting-up engines, and the smallest for incinerators, bakers' ovens, etc. Among the 28 cranes were two Ohio, two McMyler and six Brown-Hoists, which were obtained from the U.S.A. by an officer that I sent over in June, with the sanction of the authorities, and who was able to purchase and dispatch them so that the first parts began to arrive in September. The spares ordered were unfortunately lost at sea through enemy action, but others followed shortly after. I regret having had to leave these cranes to the tender mercies of the Disposals Board, as they were the best cranes I have ever seen, rough, I grant you, but very fast and of great capacity. The McMylers were fitted with Westinghouse brake, the driver well forward, and when an extra section was added to the boom they could handle 25 tons at 15 feet and $1\frac{3}{4}$ tons at 70 feet.

In July we received an addition to the then strength of 480, in the shape of a company of 250 men, and as one of the officers happened to be an architect, he assisted very materially with our buildings and shops, of which we possessed very few when he arrived. Unfortunately, the

arrival of these men synchronised with the departure of the Canadians, who were required for track laying—and very sorry I was to lose them.

I now propose to describe as clearly as I can the explosion of some ten or twelve thousand tons of ammunition that happened on the night of the 21st July. On my way back from a long day with the O.C. at Hazebrouck I passed the Ordnance Depot Officers' Mess, and as it was then about 11 o'clock at night and the car lights were full on I was stopped by some of the officers, who said there was an air raid. I asked where, and as they seemed rather vague about it, I, half laughing, told the driver to put the lights out and told the officers not to worry till a raid came: wishing them good-night, I went on up the road and to bed in my wagon. At ten minutes past one I was awakened by the sound of bombs, and looking out of my window saw three or four falling in the ammunition yard. Hurrying into some clothes, I went out, and as the night was perfectly clear and calm and the moon exceedingly bright, I stood in the shadow of the mess building and, looking up, saw a plane just over me. He was circling, and dropped a bomb that nearly obliterated a new kitchen we had just built about 100 yards from where I was standing.

Immediately after this I heard crackling sounds from the ammunition yard, the nearest part of which was only 300 yards from our depot. I went to the telephone and got into communication with the camp Commandant, who said that although the ordnance people had put out several fires, they had not been able to get near some of them, and that it appeared as if all the ammunition must go up, and as we could not do anything we had better evacuate the camp. I gave the necessary orders for this to be done, and the majority of the men went off to a rendezvous that had been arranged some time before in case of air raids.

Having been round the camp with some officers and cleared out the remaining men, I went and stood at the cross roads, where gradually a few officers and men from other units collected together, but as pieces of shell were beginning to fall in our neighbourhood the camp Commandant, who had come up, ordered us to move everyone at least a mile along the road leading from the camp and wait events. We did so, and going up a cross road running almost parallel with the ammunition yard some ¾ mile from it had a most wonderful view of the whole scene.

The night, as I have said, was perfectly calm, and the smoke was going up in a column and spreading slowly

over the whole camp like a great cloud. On the ground the effect was very much that of a lagustrum hedge on fire, flames running along the ground, a thick bank of smoke and short spurts of smoke and flame going up from it more or less like short trees, and at intervals larger bursts of fire and smoke, in which one frequently saw pieces of material, shed roofs and parts of wagons being hurled skywards.

The small cross roads on which we were standing led through cornfields to a village about a mile from the explosion, and it was almost uncanny to hear pieces of metal pattering like hail into the corn in front of us, and for a time it seemed as if they followed us as we moved up and down the road.

Soon after it was light a heavy explosion rent the still air, and whether it was the concussion or that I and a Canadian officer fell over each other I know not, but I found myself sitting hard on the road.

Shortly after this we moved on to the village, and with the assistance of the inhabitants organised some kind of breakfast for the hundreds of men that by this time had collected.

Another very big explosion occurred about 8 o'clock, and as I was watching I saw a detonating wave pass over the village. I am not sufficiently expert in such matters to explain what a detonating wave is, but I can only describe it as exactly like a dark grey searchlight beam sweeping across the morning sky—the effect was a very severe shaking that brought down tiles, chimney pots and shattered nearly all the windows of the village. This explosion, or the one before, laid flat most of the houses in a village that had the misfortune to be quite close to our part of the yard.

About 9 o'clock we received an order to move everyone, including all the inhabitants, at least a mile further away, and a curious sight our procession must have been, the officers and men helping the inhabitants to move themselves, their valuables and their families away to a brickfield, where we settled them down as comfortably as we could.

The day began to get very hot and officers that had on only mackintoshes and gum-boots over their pyjamas were looking supremely unhappy, and the men were not in much better plight, though they very soon started singing some of the well-known songs to cheer everyone up.

At 10.30 a.m. a messenger came hot-foot from the camp commandant saying that the stores yard appeared to be on fire and he wanted all the men back; so we formed up on the road and marched down towards the corner whence I

originally started and by no means enjoyed it. Having got to the corner, I was told the stores yard was not on fire, probably knocked out by the metal hailstorm, and so we distributed the men round neighbouring farm buildings and waited for the fireworks to finish.

At noon exactly, as I was feeding several hungry officers on such biscuits and bully beef as I found in my wagon, the biggest explosion—that of the gun-cotton shed—occurred, and I just had time to see an enormous mushroom-like cloud rise into the sky when the whole earth seemed to shake and threw the wagon up into the air and rattled us and the plates together like dried peas in a tin can. That explosion blew a hole in the ground 150 feet long, 40 feet wide and 60 feet deep.

Until 8 o'clock the next morning the racket went on, and even then there were occasional minor explosions, and the appearance of the yard when we went in beggars description, for a long way round and all inside there wasn't a square foot of ground where one could step without treading on pieces of shell, shell cases, cartridge cases, and the litter of five hundred wagons, all of which had been more or less damaged in the thirty hours' storm. Many acts of courage were performed that day; one officer, a well-known railwayman, taking an engine right into the yard, calmly getting down to turn the points and going to a small dug-out rescued some of his men that were being slowly cooked.

One shell fell in front of a wagon under which six men were taking shelter and killed everyone; but that was the only case of any being killed—a most marvellous thing when one remembers that there were many thousands within reach of the falling fragments.

The arrival of the first of the metre gauge stock seems rather a tame ending to an eventful month.

August was marked by the completion of two tracks in the new yard, the lay-out of which was first discussed at the end of May, and on the 27th the first parts of the new batch of wagons began to arrive.

Repairs to ambulance trains also became a burning question at this time.

From then to the beginning of December I have only noted that the first small machine shop started work; a 750 cub. ft. compressor replaced all the miscellaneous collection in the old yard and we also started up one of 1,750 cub. ft. in the new yard.

Mr. R. E. L. Maunsell, C.M.E. of the S.E. & C.R., and Mr. C. J. Bowen Cooke, of the L. & N.W.R., came over

and went into details of the proposed shops at Borre with Col. Paget and myself, and we had a run round Rouen and Oissel to try and hurry the delivery of the promised engines from the Belgians, of which only 133 had been sent to date.

Borre, which is situated between Hazebrouck and Castre on the Hazebrouck-Ypres line, was chosen as the site for running shed and repair shops and designed for 200 heavy and 120 light repairs per annum, and the arrangement arrived at with Messrs. Maunsell and Bowen Cooke was that we should do all but the heavy boiler repairs which would require heavy machinery that could ill be spared from England and instead send boilers over to them for repairs. The works, which got into their stride in April, 1917, did excellent work until they had to be evacuated in 1918, to which event I shall come later on (see Fig. 2).

About this time there was some discussion as to the possibilities of getting fireless locomotives for use near the front, but nothing came of it.

In December I had my first interview with Sir Eric Geddes, under whom I had the privilege of working until he left the Ministry of Transport last year, and it was then that commenced a considerable change in the general organisation, which as far as Audruicq and Borre were concerned culminated in April in our being separated willy-nilly from the R.O.D. and transferred to the newly-created Mechanical Engineering Department under Col. George T. Glover, then of the North-Eastern and now the C.M.E. of the Great Northern Railway of Ireland.

He established his headquarters in the D.G.T. camp at Monthuis, near Montreuil, the G.H.Q. of the British Armies in France.

This camp, a model of organisation as far as the offices went, was not too comfortable in winter as far as living accommodation was concerned, seeing that the regulation fuel rations did not suffice to warm the mess rooms as well as cook the food, and many of the good gentlemen that were brought from home and had not had two years' experience of how to "dig in" suffered very considerably.

The following is a short history of the events that led up to the appointment of Sir Eric Geddes, to whom the success of the transport work and the mobility that was subsequently acquired by the British Armies was due.

In the autumn of 1916 Mr. Lloyd George appointed Sir Eric Geddes and Sir Guy Granet to report on additions required in France. A meeting was held with Mr. Runciman of the Board of Trade on 28th November, and the next day with the Railway Executive Committee.

On 2nd December the R.E.C. submitted their proposals for releasing track and rolling stock for use overseas.

On 10th December a new Government came into power and Sir Arthur Stanley, then in charge of the Board of Trade, took up the question and reported to the Cabinet on the 19th.

Changes in working on the home railways were made on 1st January, and rails and rolling stock released.

On 30th March, 1917, Sir Eric Geddes was appointed Inspector-General of Transport in all theatres of war, and relinquished his post at the War Office as Director-General of Military Railways in favour of Sir Guy Granet, who succeeded as D.G. Movements and Railways.

On 5th May, 1917, Sir Eric Geddes said good-bye to his staff and left on the 9th to take up his post as head of a new department at the Admiralty with the title of Controller, and, as you may remember, succeeded Sir E. Carson as First Lord in July.

Early in 1917, soon after his appointment, the C.M.E. had to take over from the State Railway some partly-finished shops at St. Etienne, near Rouen, finish and equip them for repairing locomotives.

As there has already been a good description of these shops in the technical Press and a brother member of this Institution, who served for a time with me in France, will shortly be contributing an excellent paper on the same subject, I will not take up your time in going over ground with which he is more familiar than I am.

Suffice it to say that these shops were exceedingly well equipped and run on most modern lines, and when in full running order were capable of turning out 480 heavy repairs per annum (see Fig. 3).

At the start of the war the French organised a service of 27 ambulance trains, and by February, 1915, they had 38 in service capable of handling 12,000 patients in addition to some twelve trains comprising 200 vehicles for the sole use of the British. These trains were gradually released by ambulance trains arriving from England, and until 1917 were maintained by the French as far as running repairs were concerned, the lighting being looked after at Boulogne and Abbeville by a very able mechanical engineer from one of the Indian railways. He had considerable foresight particularly in persuading the home railways to fit all cells with extra high cradles, as he thought periodical washing out would be difficult to arrange. The result was excellent in that with very few exceptions the cells gave little trouble in the two years that the trains were running until

arrangements had been made and a proper cell washing and charging plant had been installed at Audruicq.

By January, 1917, the French found that they were unable to handle the repairs any longer, and as most of the trains required general overhaul Audruicq undertook the work, and from then onwards regularly repaired the following :—L.N.W.R., 8; L.B. & S.C.R., 2; G.W.R., 8; G.E.R., 4; C.R., 1; L. & Y.R., 3; M.R., 1; S.W.R., 1; N.L.R., 1; N.E.R., 1; Private, 1.

A total of 31 trains of eleven different makes, which number later grew to 43.

The sizes and make-up of the trains varied slightly, but average figures were :—Length, 900 feet; weight, 450 tons; patients, 454; staff, 44.

Details such as lighting, brakes, steam heat and fittings, of course, varied considerably, and I can safely say that no one who hadn't lived abroad and hadn't been used to thinking nine or ten months ahead could have tackled the problem of ordering spares. After Armistice, more coaches and P.O. vans were brought out from England, and twelve trains of 15-17 coaches with two mail vans were made up as passenger, leave and demobilisation trains between Boulogne-Coln, Calais-Coln, Boulogne-Marseilles and Taranto. Audruicq had to provide an officer and two men for each train, also staff at both ends of the run to do the work in France and to supervise the work of the German railwaymen at Coln. Many people are required in England to ensure the safe running of fast trains; you can imagine that those responsible for the running of these trains from Boulogne via Etaples, Arras, Mons, Charleroi, Namur, Liege, Pepinster, Herbestahl and Aix to Coln had a certain amount of anxiety, given the conditions under which they were worked.

About this time our outstations began to grow and we had to have men stationed all up and down the British and French lines to deal with our rolling stock. When I say that we had approximately 105 types of wagons running all over France you will understand what a large amount of work they gave our small office in ordering and dispatching spare parts. Nearly every station of any size in France was on our list, and at the principal ones we had to keep considerable stocks of parts which the French could dispatch without undue delay.

On 10th April, 1917, the L. & N.W.R. was asked to provide a train of ten vehicles for the use of the Commander-in-Chief, and very shortly after that—on the 12th—the shops at Audruicq were asked to get together a tem-

porary train for use until the L. & N.W.R. train arrived. This temporary train had to be made up of such vehicles as could be obtained, and eventually was composed as follows:—One Etat brake van; one Nord brake van; one S.E. & C.R. Royal saloon; one restaurant; one Nord 1st class; one restaurant (used as office); one Nord 1st class; one Nord 1st class; and three P.L.M. brake vans—eleven vehicles of five different companies, 271,900 kilos., 529 feet. Owing to the variety of lighting systems and to the fact that the train would be standing for long hours at a stretch a small petrol-driven set had to be telephoned for from England as well as the necessary cable. This was asked for on a Friday, purchased by the S.E. & C.R. and shipped on the Sunday, collected from Boulogne, arrived at the works 3.30 a.m. Monday morning, fixed in its van and left on Monday night. All the usual equipment of a train had to be collected—alterations had to be made in the interior of the coaches.

On 5th May five of the L. & N.W.R. coaches left, followed by the others on the 12th—one month after the order was given. The details of this train you have probably all seen in various papers, but you probably have not seen that little by little this train grew into two, for it was found that, in addition to the C.-in-C. and his staff, some of the General Staff had to be accommodated, to say nothing of the map section, clerks, guards, etc. Every time either or both trains moved, special arrangements had to be made, the "make-up" frequently altered, coal and water supplies arranged for, an officer and five men detailed to look after the heating, lighting and running. There was a fifty-line telephone exchange on the train serving all offices and compartments, and so perfect were the arrangements made by the R.E. Signals that communication with the War Office and G.H.Q. was usually established within eight minutes of the arrival of the train at its destination. In some cases the train had to be completely hidden from the observation of enemy airmen, and I wish I had time to tell you something of the way it was camouflaged.

Owing to Sir Eric Geddes, who was by this time Inspector-General of Transport and had been asked to look into transport questions in Egypt, being recalled to take up his new duties at the Admiralty, it was arranged that a commission, consisting of Brigadier-General Stewart, who had charge of all construction work and was well known in peace-time as Canada's most successful contractor, Colonel McLellan of the firm of Merz & McLellan, and myself, should go out and report on the Gaza Railway.

After some delay in Marseilles we left on the 24th in the "Saxon," escorted by Japanese destroyers, and arrived at Alexandria on the 31st, having sighted one enemy submarine which we hoped was sunk by the destroyers. After interviewing the authorities in Cairo we proceeded to Kantara, the big camp on the far side of the canal, noticing on the way the ingenious manner in which railway vehicles were convoyed across the canal on a floating arrangement consisting of an old turntable carried on pontoons, which carried three wagons at a time and was wound across by two capstans worked by four men each.

At Kantara there were two very useful running sheds, and as the E.S.R. shops were only four hours away the R.O.D. men were in clover compared to us in France, although they had their own special troubles in the form of sharp sand, which literally eats certain parts of the engines such as wheel flanges. On entering the mess we found one of the Central Uruguay traffic men preparing us a cocktail. Early next morning we started out in a coach that bore considerable resemblance to an Argentine service coach, and found that the engineer was from the Buenos Aires Pacific Railway, the chief engineer being a very well-known R.E. from the Sudan Railways.

The line, a single one, ran at that time to El Arish (155 kilos.), Rafa (200), Railhead (221), Gaza, in front of which our army was encamped, being 236 kilos., and one of our duties was to consider what would be required should the forces advance and the railway require extending to Jaffa (320), Haifa (402), Beirut (572), Tripoli (648), Homs (743), and Aleppo (943), taking into account the use that might be made of landing supplies from lighters at the various ports. The railway, which was worked by telephone control and ticket, was capable of carrying 23-24 trains occasionally and 16 regularly to Rafa, unless held up by sand storms, which were very frequent—as many as six derailments occurring in one day.

It is interesting to remember that in February, 1799, Napoleon and his army took $3\frac{1}{2}$ days to El Arish and 3 days to Gaza.

Some 2,400 railway troops were employed for operating and construction, and the stores required amounted to 11,000 tons per week.

The most interesting feature of the railway was the pipe line, which was taking water by triple siphon under the canal from the sweet water canal to storage reservoirs at Kantara—conveyed it the whole way along the railway. The pipe line was covered with sand, first to a depth of one

foot and later to three feet on account of the attention of Turkish airmen, and varied in distance from the rail from 0-2 kilometres. It was laid by Egyptian labour working under Greek foremen, controlled by British soldier mechanics —some 3,500 men spread over 50-70 kilometres, requiring 150 camels to supply them with rations. So well organised were the gangs, some of whom worked on screwing the wrought iron welded pipes, others on valves, expansion joints and tee pieces, that only four months elapsed from the time of screwing the first pipe to delivering water at El Arish (155 kilometres), and better progress was made to Rafa (204 kilometres). Main pumping stations each had two ferro-concrete 250,000gal. tanks, two Hackroyd 66 h.p. and one centrifugal 27,000gal. pump, both duplicated. After several conferences with the General and his staff we returned to Cairo, once more visited G.H.Q. and left for Marseilles on the R.M.S.P. "Aragon" on the 9th June, arriving the 16th, having been twice round Malta to avoid submarines.

The 3rd and 5th July were great days at Audruicq, for two "important personages" visited the camp—His Majesty the King on the 3rd and H.M. the Queen on the 5th.

I have a note that at the beginning of August, 24 firms were supplying fifteen types of wagons, and it is due to the fact that I had had experience of missing parts—roofs arriving before the wheels—when erecting a few thousand wagons on the B.A.P. that led me to insist on all cases being marked with various coloured bands of paint that prevented the hideous confusion that otherwise might have arisen when one thinks of the number of times the 150,000 packages (ten per wagon) were turned over from works to train, train to ship, ship to train, and then the sorting into heaps in our yards.

I have been asked to make special mention of the ferries, but I regret to say that I find I have very few figures, and beyond knowing that they were being prepared I saw nothing of them until they were in running. The first notice I had of the ferries was in August, 1917, when I was asked to make some trials with various engines and rolling stock on an improvised ramp to assist the constructing engineers in determining the maximum grades that could be worked, the rise of the spring tides at Newhaven and Dieppe being respectively 19¼ and 27½ feet. Various engines and wagons were tried, notably one of the big Canadian built 2-8-0 and a small shunting engine, French flats and highsides, and some long English passenger bogies and 45-ton tank-carrying flats.

The steamers, which had four roads on them, were 363ft. 6ins. long, 61ft. 6ins. broad, 10ft. draft, displacement 3,654 tons, speed 12 knots, and the average load carried 900 tons.

Every wagon and coach coming into France had to be examined by us; in some cases parts such as steps that had been taken off had to be hurriedly replaced as there was little room to do the work, and finally passed by a French inspector. Audruicq had to supply men to Dunkerque, Calais and Dieppe for the purpose.

Some unexpected trouble arose at the end of August, when an ambulance brake van which was coming into the yard for repairs gracefully sank down on one side; we found that the Mansell wheels had collapsed, owing to the brake being left hard on burning the wooden centres. As we had a large number of brake vans with these wheels we had to apply to England for wheels of another type and change them as rapidly as possible.

The night of 3rd September was quite one of the worst we spent, for we were treated to five hours' continuous bombing and lost an officer and 130 men; the material damage was small.

I am unable to give you the actual number of bombs dropped on Audruicq, but we all suffered from many sleepless nights owing to our being fairly close to the Boche aerodromes and more or less in the track of the flying men when visiting Dunkerque, Calais, Boulogne, Etaples and Abbeville.

I have record of 132 alarms between June, 1917, and 2nd July, 1918; on some occasions two and three in a night; at first only when there was a good moon, but later on the planes passed over us whatever the weather (see Fig. 11).

I was very pleased at the end of one of our meetings with the French by being told that the hot-box situation was quite normal compared to theirs and that our grease boxes were the only ones that gave any trouble, and it is interesting to remember that the State railway had to revive the old regulations regarding the handling of grease boxes of the days when that railway was the Western and had English rolling stock.

The 1st October—eighteen months from the start—saw the 10,000th wagon completed.

Part of my time was spent this month on a standardisation committee and a considerable amount of good work was done, particularly with pneumatic tools.

In September, 1917, a plan was prepared for making up leave trains with 20-ton covered wagons, owing to the appalling condition of the French passenger stock that had

been running since the beginning of the war with practically no repairs to the bodies, so that nearly every window was missing and in many cases the doors were off. One sample van was got ready and a complete train of 35 was ready for service in a month—this after several changes of plans, and during the time that a large number of 45-ton flat wagons were being prepared to carry tanks.

In addition to the foregoing, as well as repairs to the French trains, no less than 95 trains of 35 wagons each were fitted up for leave men—seats, stoves, racks for kit and rifles being provided—and in each train one wagon was fitted as a kitchen which could give a hot meal to 1,000 men in an hour. Owing to the scarcity of covered wagons many huts christened "Noah's Arks" were constructed rapidly by every available workshop, army and railway. These trains ran over the whole of the E. and S. of France, and down to Taranto at the foot of Italy.

About October, 1917, when Dunkerque port was closed for a time and that city was being bombarded from land, sea and air, or it might have been a little earlier, I was going along a quiet country lane in a car when something that looked like a cross between an armour-plated traction engine and a megatherium calmly scrambled up a slippery lane into a field. This was my first acquaintance with a tank, and though I naturally wanted to know all about it, I did not think at the time I should spend many interesting days with the creatures at their home at Erin, for such was the name of the place where the Tank Corps had their workshops.

The tanks were transported to ports in England on 35 and 45-ton trucks specially designed, sent over in ships, and then loaded on French or English flat wagons, both of which suffered rather severely by becoming hog-backed. Later on, when the ferries were in action, the tanks were taken direct to the Tank Corps shops on home wagons, and so regular did the service become that the turn round of the wagons was reduced from 14 to $5\frac{1}{2}$ days.

There was a good deal of correspondence in the papers as to who invented the system of side-loading, but I know that in France we spent some sleepless nights inventing ramps of various kinds for both side and end-loading, and eventually hit on the idea of a fixed screw working through the floor of a small two-axle wagon, by which the wagon could be raised at one end sufficiently to enable the wheels and axle guards to be removed and then lowered on to the ground so as to form an inclined plane up which the tank could walk on to the train. For the first wagons that came

over with tanks we had to make hundreds of wooden tee pieces to put under the headstocks to prevent hogging, but as much of the loading and unloading had to be done at night these were constantly getting lost, so a permanent jack was arranged under the headstocks to support the ends as the tanks moved on or off the wagons. Some of my men were stationed at Erin to attend to the wagons, and some had to travel with them, particularly when going into action, the transport of the tanks—some 300—for Cambrai being probably the largest gathering we had to do with.

The Tanks Corps General paid me the great compliment of asking me to report on their workshops, but I found the works so extraordinarily well organised and so very interesting that I am afraid my report was not of very much assistance to him. It would not be safe for me to say very much about the shops, for I see one of the officers is present with us to-day and he might begin to throw things; but I can safely say that although the shops were got together with much difficulty and a large proportion of the labour employed was Chinese, they could give points to many of the shops out here.

The end of the year saw us very busy at Audruicq assisting with the construction of a camp for 400 Chinese, who arrived at the end of December and had to be sorted out on to jobs for which they were suitable. Although the "Chink" tradesman does not come up to our ideas of what a man should be—for instance, their blacksmiths were better at brass work, engraving and the like—they were all very clever at picking up work of all kinds, and I soon had them erecting wagons alongside British, Australian and others, and their output was very creditable.

In place of doing repairs to Nord wagons and other French stock which we had been doing for some time, it was arranged to give up all these and take over the entire repairs of the ambulance trains, light as well as general, and I had to make a rush visit to Paris to arrange with the French for spare parts for repairs to their leave trains as well as consult with the P.L.M. Railway authorities on the subject of our trains running through to Italy. I was also sent over to England to see about improved wagons for tanks as well as make fresh arrangements for extended journeys of the C.-in-C. train, additional staff and so on.

The year 1918 opened briskly with meetings about new shops to be opened at Rouen, Oissel (see Fig. 4), and a subsidiary depot for ambulance trains at Terlincthun, near Boulogne, and the end of February saw the completion of the 13,099th wagon.

In March we were asked to supply men to help with trench tramways—to make hundreds of duckboards for a large camp of 7,000 Americans—to assist in repairing locomotives, and to erect 79 2-8-0, 2-6-2 and 0-6-0 engines, which could not then be handled at St. Etienne.

The first parts of these began to arrive on 10th March; the first engine was received complete on the 18th. They were all erected in the open on the track system by the men who had erected the wagons, helped and guided by half a dozen locomotive fitters. As the enemy were getting uncomfortably near, every effort was made to get the engines together so that if necessary they could be hauled to a place of safety, and so well did the men work that they were all finished by 10th May—62 days from the arrival of the first case and 53 days from the arrival of the first complete engine (see Fig. 5).

On 25th March we posted guards all round the camp for the first time, having received instructions to do so as the Boche airmen were supposed to be coming to drop spies in our neighbourhood, and two days later one of the first signs of the Boche advance appeared in the shape of a light railway repair train which had been rushed away from Achiet-le-Grand in the nick of time, as the enemy were only a few hundred yards away when it started.

On 9th April the Boche advance was in full swing in the North, and as the C.M.E. was in England and I had to relieve him, I thought it advisable to run up to the works at Borre, from which the enemy were only distant some eight miles, and consult with the O.C. as to the steps that should be taken did it become necessary to evacuate. I went first to D.G.T. and across country via Aire and Hazebrouck to Borre. Aire was completely deserted, and a few shells were dropping in and around as if to say no one must return here at present. As I went into Hazebrouck on the side nearest the enemy I noticed the inhabitants carrying on their usual work as if nothing was happening, although shells were falling in the far side of the town, doing endless damage. Borre was not being shelled at the moment, but the shells on their way to Hazebrouck passed over the camp and their cheery whistling made me wonder if it really was necessary to have any dinner at all, and I inwardly cursed the O.C. who, by the way of entertaining me, insisted on a quiet game of bridge before I left again for Audruicq. I am by no means a keen bridge player, and I positively disliked the game that night, especially when the call was spades—sort of connection between the big fellows overhead and a quiet corner of Mother Earth.

It was a good thing the O.C. at Borre and I had a talk, for on the night of the 11th I had to ring him up and tell him to get busy and get out with as much of the material as he could remove, for the enemy then were within four miles. The lads worked so well that in three days and nights they had got out loaded up and dispatched to Audruicq practically everything except the big wheel lathes and an engine or two that were not down on their wheels —this under shell fire most of the time—and I am glad to say three hundred of them turned up at Audruicq safe and sound on the 13th, followed the next day by the remainder.

On the 20th new works were started at Rang-du-Fliers and were in full blast, turning out three to five engines a week, besides repairing metre gauge stock and making ballast ploughs, telegraph post slotting machines, and a hundred and one other things, early in September (Fig. 6).

The enemy never got as far as Borre, and consequently all the carefully prepared plans for evacuating Audruicq were never required to be put into action, but the month of April was a very busy and exciting one, as the following brief entries show :—

Locomotives by ferry to England.
Track destroyers.
5.9 dropping in Berguette.
Meeting Base Commandant, Calais, *re* evacuation.
C.-in-C. train alterations.
Rang-du-Fliers started.
Oissel started.
Machine gun fittings and 28,000 blocks for light railways.
Flooding round Gravelines—six petrol centrifugal pumps, 600,000 gals. each.
Teaching men rifle drill.
Thirty flats to fit with bolsters.
Nord to use part of St. Etienne.

Time will not permit of my going into many more details between April and July, when on the 8th the C.M.E. left to take up his post on the G.N.R. (Ireland) and I was ordered to D.G.T. in his place. On my arrival there I was told to look into and report fully on all mechanical work connected with railway transport, and I soon found myself responsible for the light railway shops at Beaurainville (see Fig. 7), as well as all the broad gauge and some 7,500 men.

I regret I cannot go into details of the shops at Beaurainville, which were built when the original ones at Berguette had to be evacuated, nor expatiate on the wonder-

ful work done by light railways generally, and in any case General Harrison has already done so; suffice it to say that they were well planned, extremely well equipped with modern machinery, and did rather more work than was expected of them.

I must here also refer briefly to the electrical side, for we had excellent power stations at all the works, economically run, mostly on sawdust and scrap timber, and in addition two complete portable power-station trains with 250 K.W. generators and boilers that could be fired with either coal or oil (see Fig. 8). Originally intended for starting up works in Belgium or Germany directly there was any advance, they proved of considerable utility in getting our own machinery moving in several of the works during the course of construction. If it were not for the counter-attraction of the brewery which you are to visit at the end of this meeting I am sure one of the members present could tell you a great deal more about these matters.

Many other interesting things, such as sending locomotives out East, designing rail-cutting and straightening plants, picking up a 12in. gun which, with its carriage some 200 tons in all, had derailed and fallen on its side (see Fig. 9), fitting up prison vans, rescuing a 92-ton tank engine from a canal (see Fig. 10), could give me enough material to keep you here for several hours.

The principal part of the work was, of course, the repairing of the 1,600 out of 1,900 engines that seemed to be required by the R.O.D., with whom I was once more in close touch.

The engines were required as follows:—Main lines, 995; railheads, 237; bases, 330; construction, 80; banking, 130; sheds and depots, 200. The actual numbers at the moment were 1,350 available, 180 in sight.

On 8th November I visited Dunkerque to see if, amid the ruins, I could find a shop where we could carry out repairs instead of sending all engines back to St. Etienne or Rang, and which would serve as advance shops in the event of the R.O.D. having to work right across Belgium into Germany.

The 11th November modified one's plans very considerably, and I am sure you will be interested to hear that on the 13th I received instructions to prepare a scheme for restarting the training of all engineering apprentices who could be released from the fighting forces.

Having passed 11th November, you all probably wish a truce to my lecture, but if it doesn't bore you I will try in the next five minutes to show that after Armistice we

were, if possible, busier than before, and without the same incentive; however, the work was very interesting, and its extraordinary variety prevented it from becoming monotonous.

A little order for 2,000 box spanners wanted immediately for relaying track wasn't a bad start; they were finished in four or five days.

At Armistice on 2,133 kilometres of Nord Railway there was not a bridge, station or tunnel that had not been destroyed, and yet such was the energy of the French that by the end of 1919, of the 600 bridges temporarily restored, 475 had been permanently reconstructed and quite two-thirds of the stations and goods depots. The enemy damaged or destroyed all that they could, and it is no exaggeration to say that they blew the ends of all the rails over which they retreated.

In addition, they left an enormous number of delay action mines set to go off at varying intervals. An officer went from G.H.Q. in a car to Paris, and after an interview with Marshal Foch went to the frontier and received from the Germans, who had been sent from Berlin on receipt of wireless orders from Marshal Foch, plans showing the location of hundreds of mines. He returned to G.H.Q. in 48 hours, and the Field Tunnelling Companies who had had copies of the maps made by the Topographical Section discovered about three in every five, and how important this was is shown by the fact that one undiscovered mine blew a hole in an embankment 150 feet long that took 78 hours to fill.

Many stations were left in an appalling condition, and at Monceau and Luttre, where the Boche had sandwiched ammunition trains in between ordinary trains and had blown the lot, it took my men working with two cranes six weeks to clear away the debris.

On 20th November I was sent to Brussels as British representative on International Commission, whose duty it was to receive and examine the rolling stock that was to be handed over by the Germans under the terms of the Armistice. The number promised were 5,000 locomotives and 150,000 wagons. Immediately on receipt of the orders I left Montreuil by car, passing by way of St. Pol, Bethune and La Bassee to Lille.

Lille, which I had visited on 31st October, was still in a precarious condition as regards food, for supplies had not then begun to come in regularly and it seemed curious to put up at a large hotel, the restaurant of which could only supply one with coffee which had certainly never seen any

of the berries from Brazil or Mysore. Although Lille itself was not much damaged, it was difficult to find one's way out, as bridges had been destroyed, and a railway bridge that had been blown up blocked the roadway. I examined the Nord and other shops and found them completely gutted, the only things left being some shafting, a very heavy punch and shear, and some overhead cranes which had been put out of action; beyond these there was not a thing—not even the usual rubbish, of which it would have been difficult to find a hat-full. The main road to Brussels passes through Tournai and Ath, and it was no easy matter getting through the crowds of vehicles going in both directions; transport of all kinds taking our supplies up to the Armies; Belgian, French and British troops moving in both directions, and natives of all classes, with their worldly possessions packed on every conceivable kind of vehicle from a farm cart to a perambulator, slowly moving in the direction of their battered homes. After having been pestered with the attentions of enemy aeroplanes for many nights and many times a night, it was quite cheering to see every little cellar marked with a German indication as to there being shelter from our flying men.

Brussels on the 21st of November appeared at first sight to be very much in its ordinary condition—shops open, tramcars running, and the inhabitants going about their ordinary work—and it was difficult to realise that it was isolated from the outside world except by motor or flying machine, and that the only way our Commission had of communicating with H.Q. was by wireless to Ostend, thence to Spa or Montreuil. The railway stations had been badly knocked about, signal gear and telegraph wires hopelessly mixed up; still, we got to work and made arrangements with the Belgian railway authorities for distributing small parties of examiners over the British Army area to examine and mark all rolling stock that was in good order.

On the 22nd the King and Queen of the Belgians made their first entry into the city.

On the 23rd, after fixing suitable headquarters for our sub-commissions and defining zones, I returned to H.Q. to make the necessary arrangements for transport and feeding, and returned again to Brussels on the 24th. Officers and men had to be stationed at seven points in our area, whence they could cover some 500 miles of line over which the German material was spread.

Works had to be visited and inspected with a view to occupying them temporarily for repairing our rolling stock, and one or two were staffed and started up.

Examiners had to be found to assist the R.O.D. at various points.

Wagons kept arriving for some time after the Armistice as there were none too many available until the Boche wagons were handed over.

Volunteers had to be found for Russia.

In January, 1919, the Germans were notified that all rolling stock not removed by the 4th would be considered "prix de guerre" (spoils of war), and as a great deal could not be moved this had to be marked, and machinery had to be listed. In one private shop at Monceau twelve locomotives partially repaired were found. On the 19th snow ploughs had to be hunted up and fitted on several engines.

Programmes for gradually closing down the shops were arranged; storage accommodation for engines that could be spared to send home had to be found.

Machinery was asked for for Russia, engines and wagons for Roumania, and all this time Audruicq was still busy with odd jobs of all kinds, 400 repairs per week, erection of U.S.A. wagons; Rang still carrying on five locomotive repairs per week; St. Etienne still clearing up the remaining repairs to engines there; Oissel dismantling; Beaurainville repairing and cleaning up light railway stock.

Meetings with Disposals Commissions took up a great deal of time explaining what was available.

Not until May did any of the work begin to slack off, as only at the end of the month could the blockmen be withdrawn from Belgium and the Nord Railway commence taking over, and locomotives be shipped home by ferry; at least, those that were not being lent for a short time to the French.

The engines had to be got to points close to the ports before the bulk of the men were demobilised.

About the 10th June, D.G.T. camp began to be reduced and moved to a smaller camp near Boulogne, and all records from other shops were concentrated at Audruicq as being the point nearest home.

At the same time three fresh trains had to be got together for running between Boulogne and Marseilles, and arrangements made for maintaining them—work which the French could not undertake.

Further vans had to be converted to kitchen vans for demobilisation trains. A.T. Pharmacy coaches, now no longer required, had to be converted to P.O. vans in order to release the latter for return to England, and still further wagons found for Roumania.

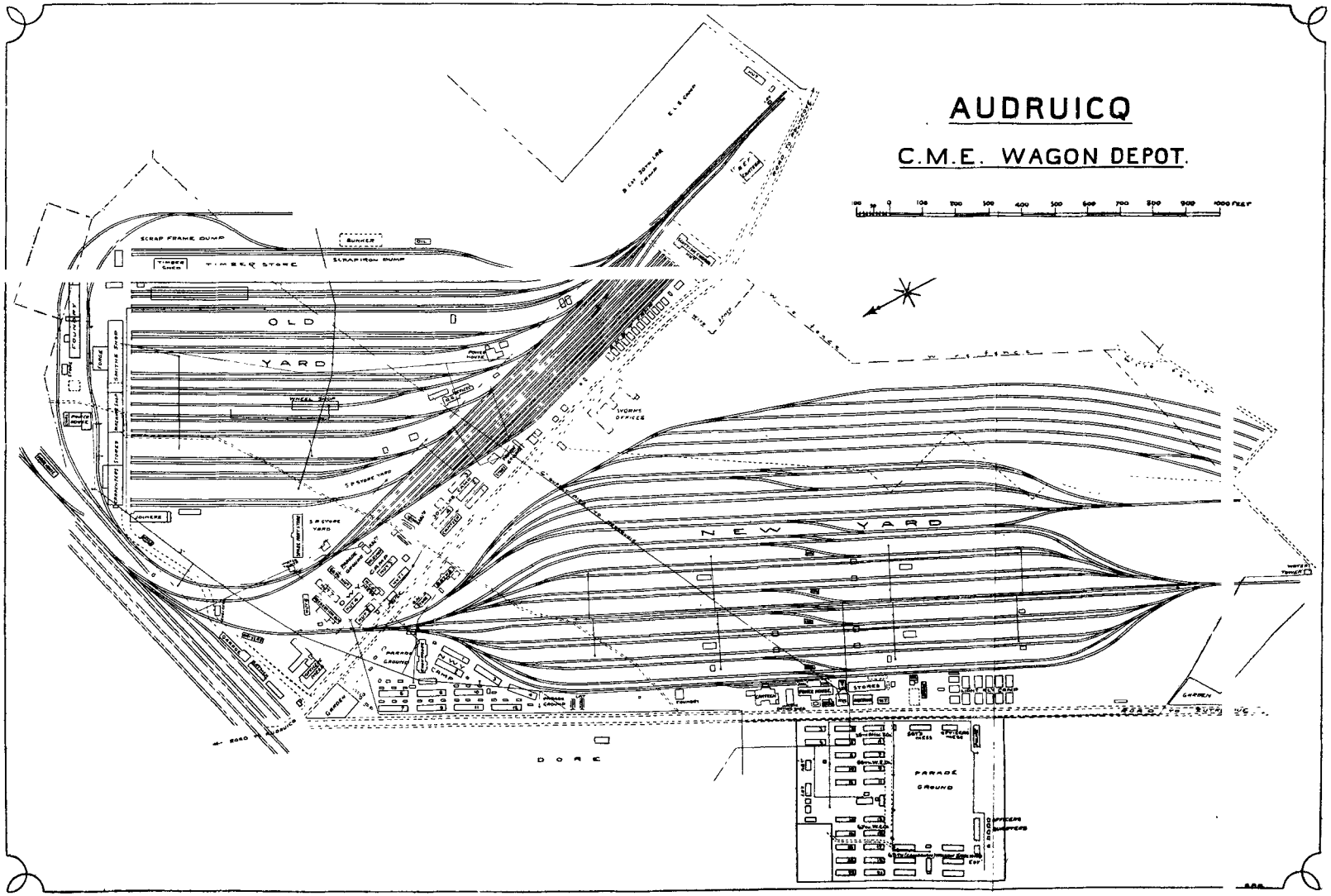


FIG. 1.

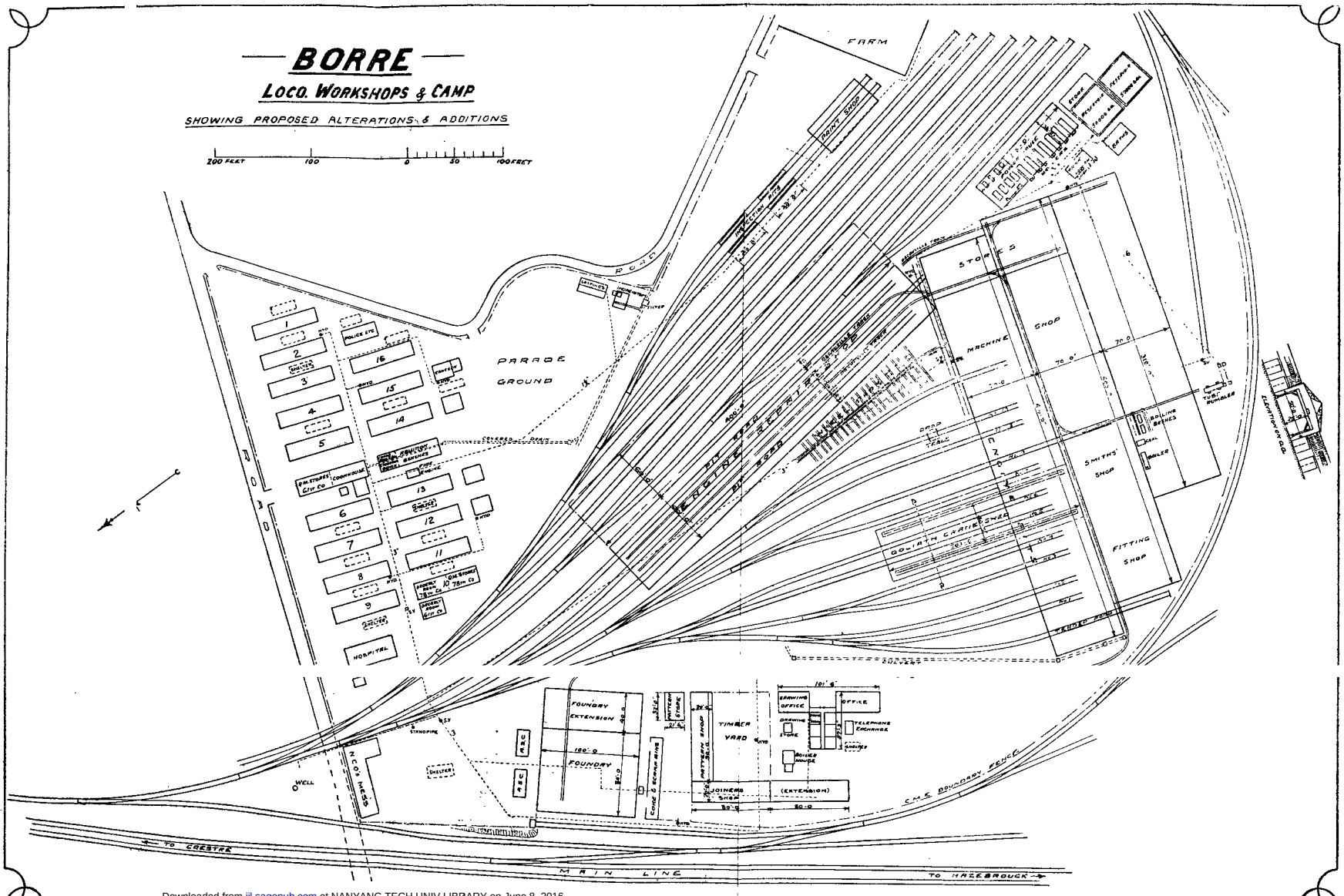


FIG. 2.

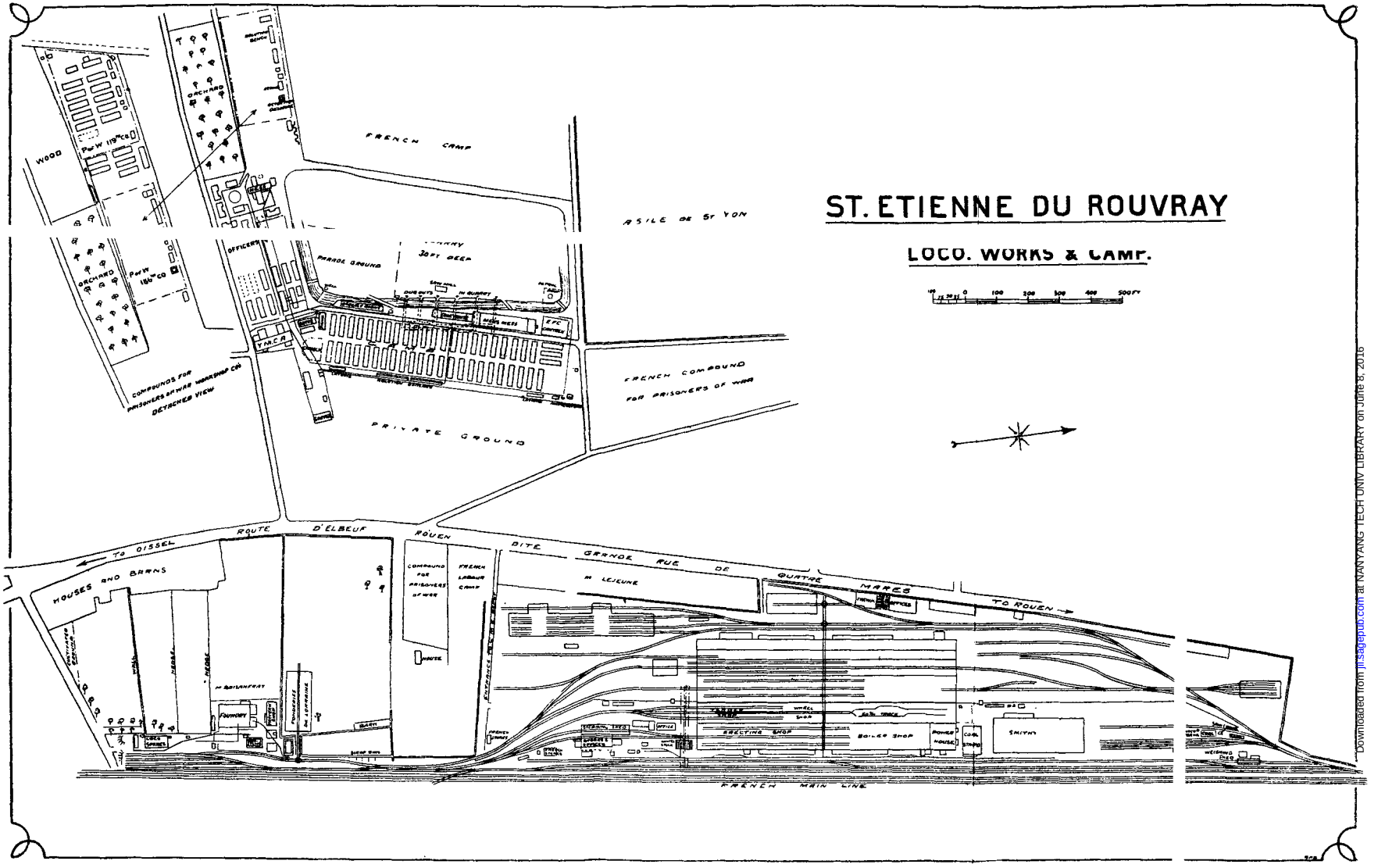


FIG. 3.

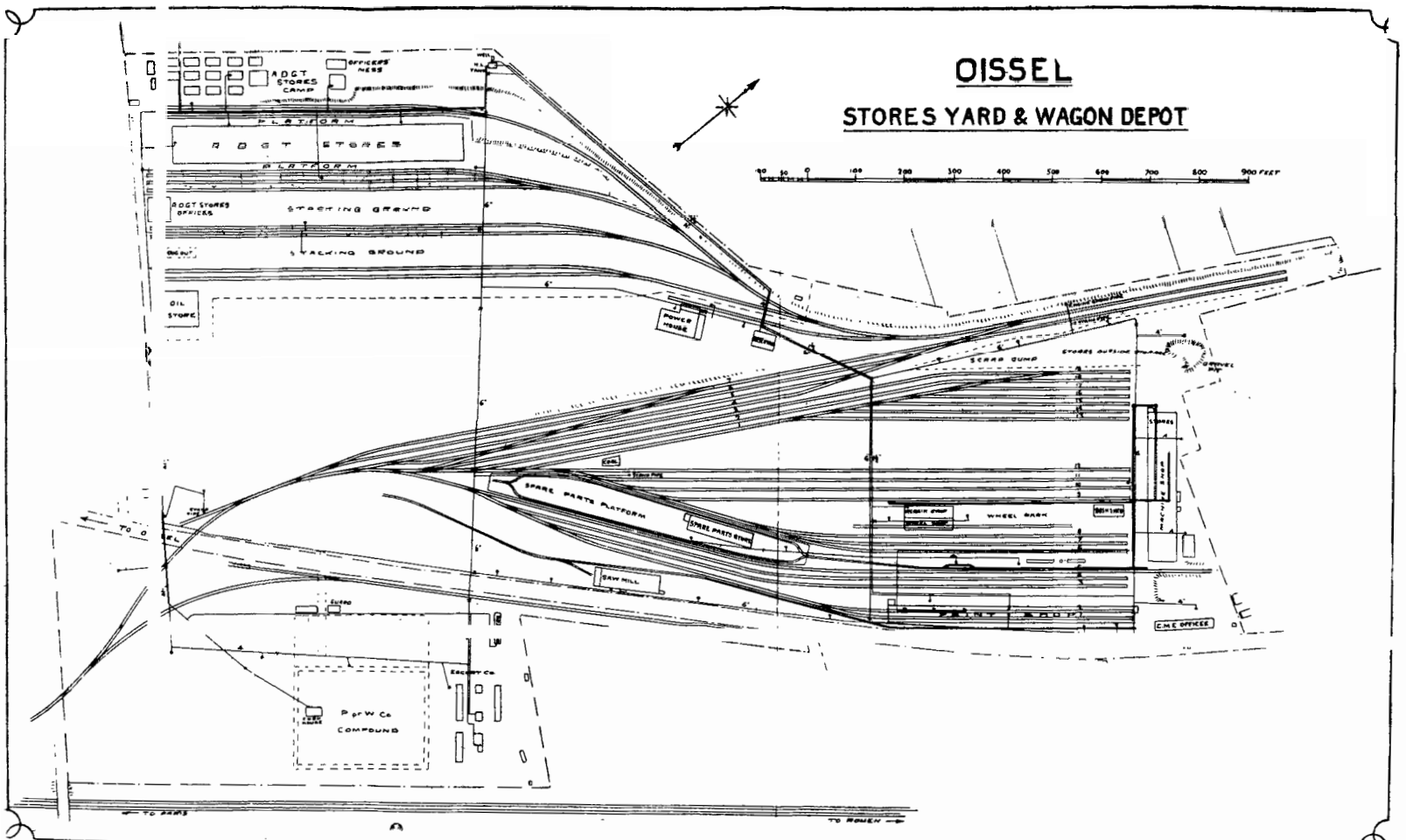


FIG. 4.

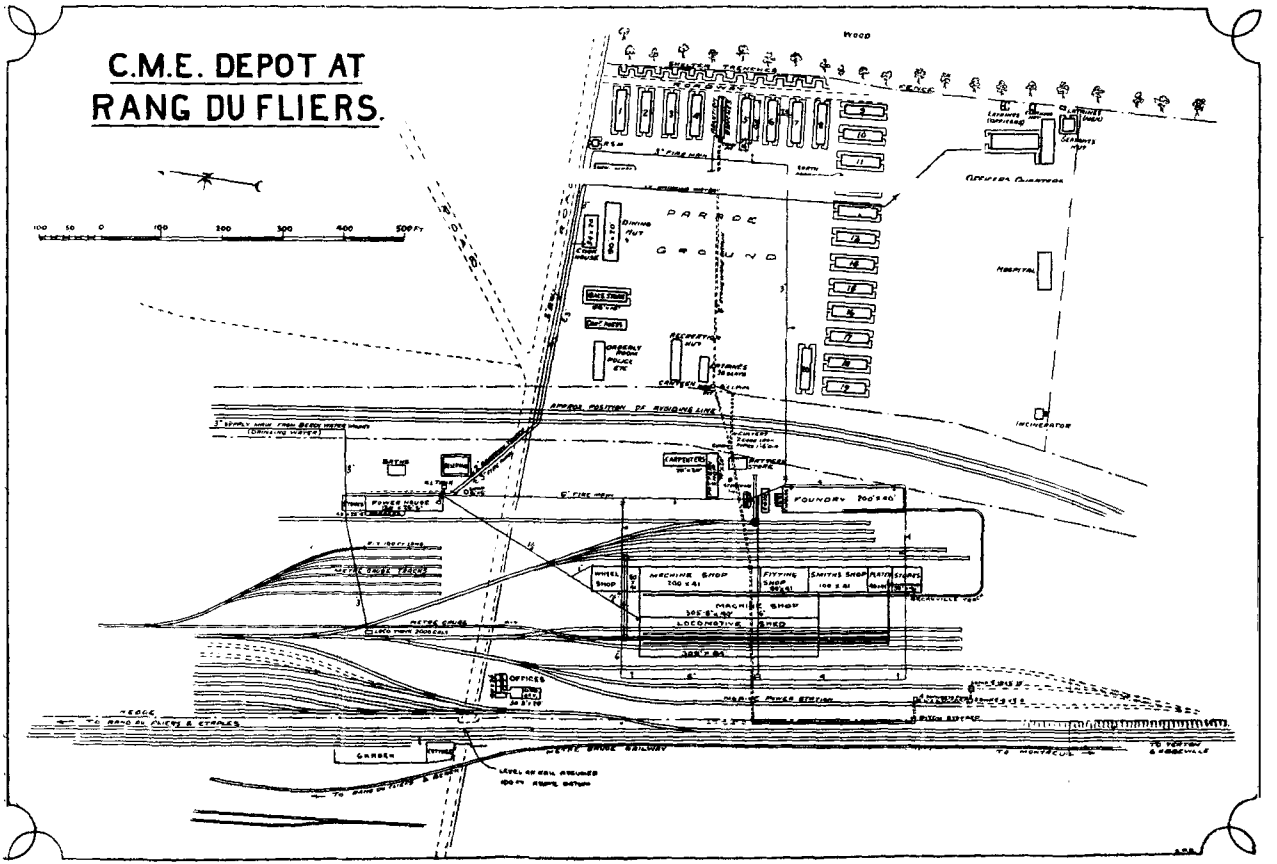


FIG. 6.

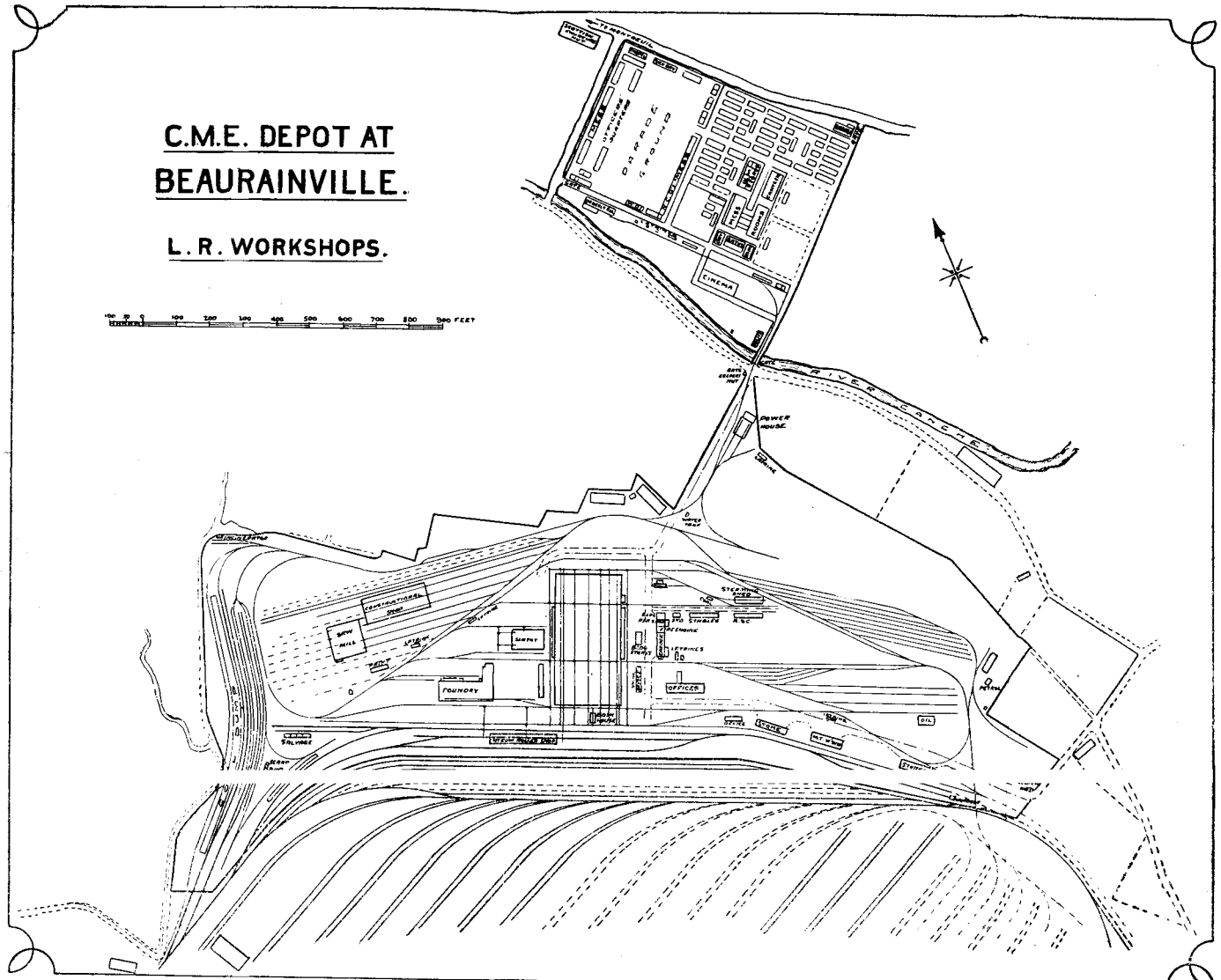
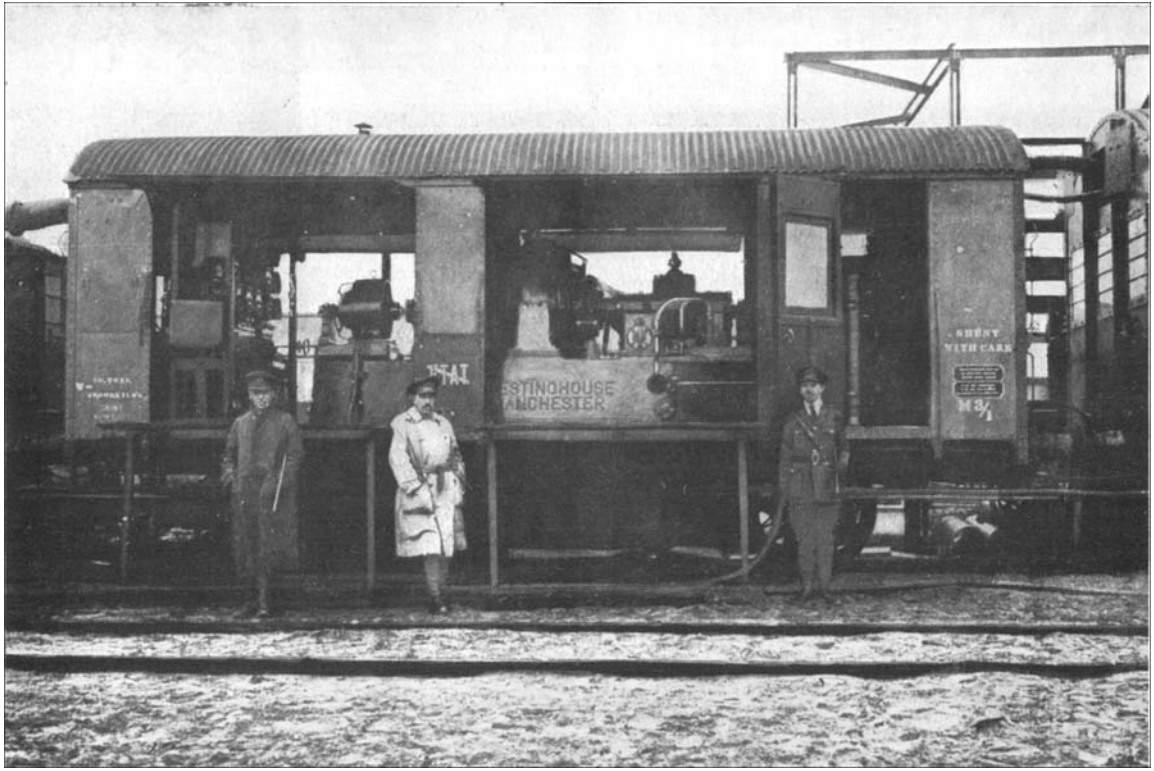
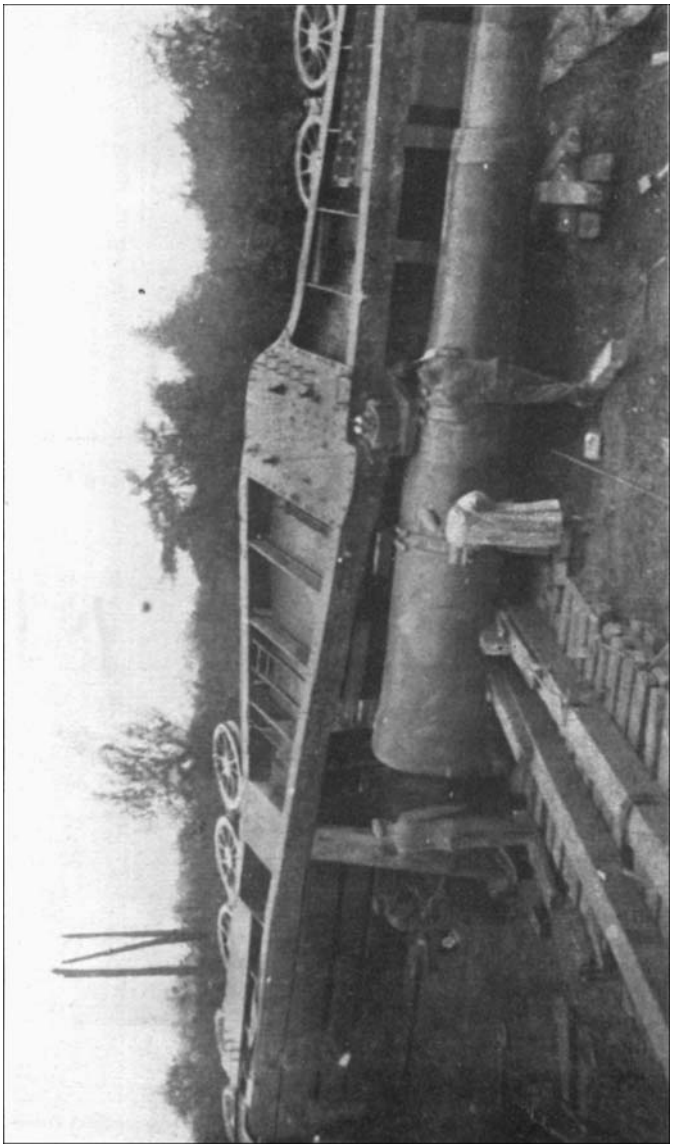


FIG. 7.

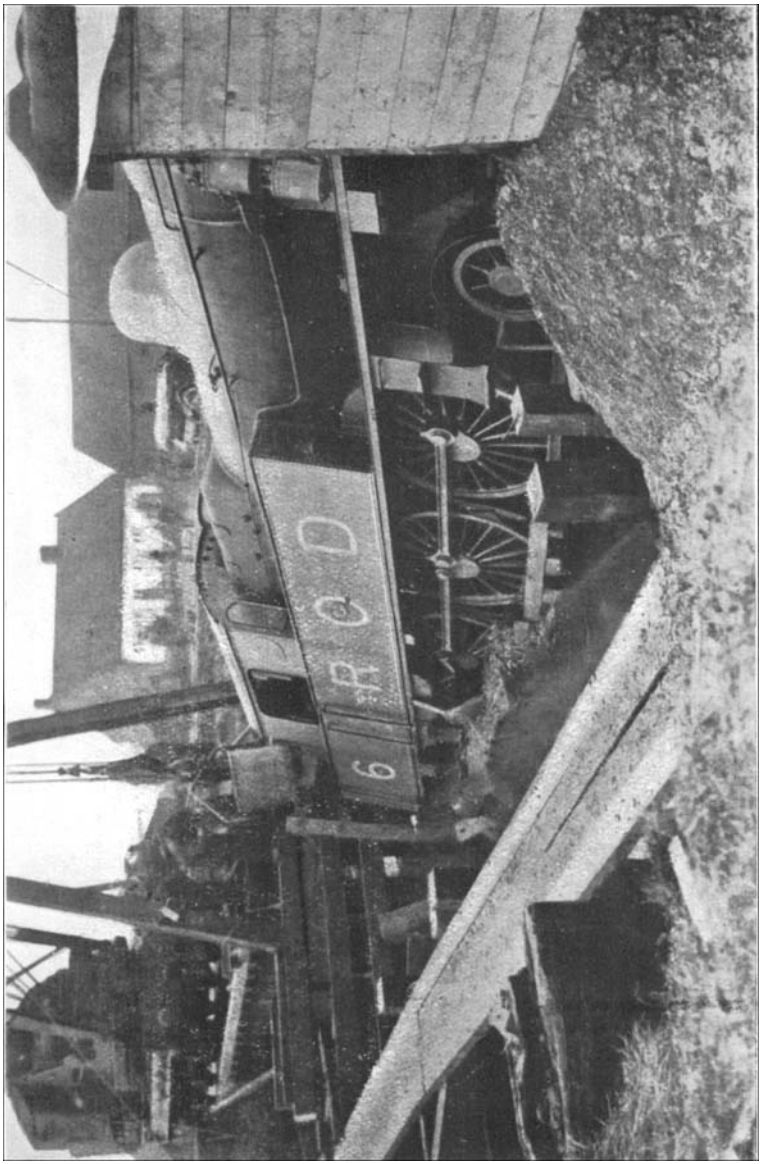
ERECTION OF BALDWIN ENGINES.
FIG. 5.



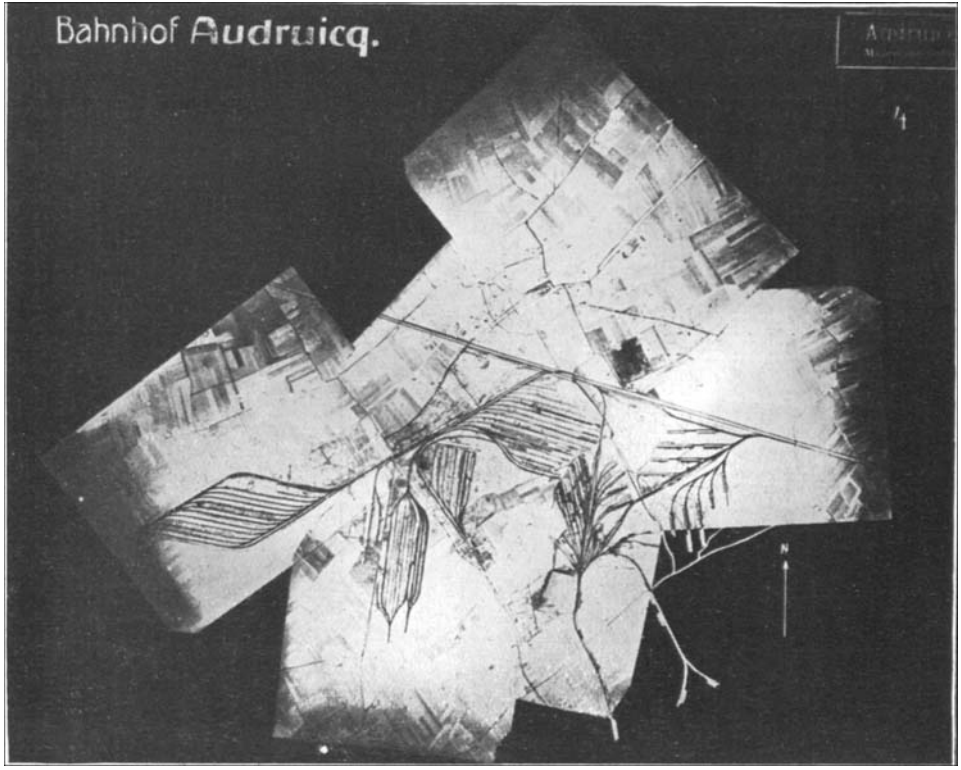
PORTABLE 250 K.W. POWER PLANT.
FIG. 8.



Derailment of 12in. Gun (on Railway Mounting).
Fig. 9.



92 Tons 4-6-4 Tank Engine in Canada.
Fig. 10.



COMPOSITE PHOTOGRAPH OF GERMAN AEROPLANE VIEW OF AUDRUICQ.
FOUND IN BOCHE BILLET IN BRUSSELS, 1918.
FIG. 11.

At a meeting I attended in Paris on 25th July, the Nord said they could only allow us fifty trains per day in all as they had 40 per cent. of their engines under repair, and discussions took place as to their purchasing some of our engines.

By the 26th August there were still in traffic 518 engines and 48,407 wagons, 7,220 wagons having been reshipped home.

Another visit to Paris with one of the disposals branch to arrange the sale of 164 engines and one of the big works.

The story practically closes on the 5th September when C.M.E. and R.O.D. once more became one, with the remaining construction troops thrown in.

My own war work concluded on the 21st, after a day or two in London, seven hectic days in France, the last two being spent with our financial Commission in Ostende arranging the sale of a large number of wagons to the Belgians.

The Chairman: We have all listened to Mr. Simpson's most interesting lecture with the greatest pleasure, and in your name I thank him sincerely for the care and time he has given to write and deliver same. I ask you to join me in a hearty vote of thanks to Mr. Simpson.
