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Major T. E. Compton

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THE FRENCH TANKS.

By MAJOR T. E. COMPTON.

Their Conception, Employment and Evolution during the War up to the Signing of the Armistice on November 11th, 1918.

IT seems strange that two Allied nations so intimately associated in a common effort as were France and Great Britain in 1914, 1915 and 1916, in which effort, moreover, the creation of new war material played so prominent a part, should each have brought to about the same degree of practicability, quite independently, the new war-engine known in England as the "tank"¹ and in France as the *char d'assaut*, without the knowledge, apparently, that the same work was in progress in the other allied country across the Channel. It was not till June 25th, 1916, that General Estienne (then Colonel), the inventor of the idea in France, who was subsequently the distinguished head of the *artillerie d'assaut*, was sent to Lincoln on a mission of inquiry. At that date in France 400 tanks of Colonel Estienne's invention were approaching completion at Creusot (Schneider Company) and another 400, similar but with electrical control, at Saint-Chamond (Société des Forges et Acieries de la Marine), these latter designed apparently by the engineers of the establishment after communication with the Government.

The "tank" question was more forward in England than in France—notwithstanding the delays complained of by Sir Albert Stern—for

¹ As is well known, the "tank" was given originally to the new invention in order to camouflage its manufacture. It was given out that these engines were oil tanks for Petrograd.

two reasons: the serious situation in the early part of 1916 at Verdun, where Colonel Estienne was commanding the Artillery of an Army Corps and, secondly, the policy in favour in France of accumulating several thousands of tanks before disclosing the secret to the enemy. The first intimation, it was hoped, he would have of their existence would be the breaking of his front by the irresistible onset of thousands of *chars d'assaut*, combined with the effects of a complete surprise. The British policy, on the other hand, which indeed was also that of the *Grand Quartier General*,¹ was to put a certain number in action as soon as possible, in order to gain experience of their capabilities under fire, with a view of discovering the possible improvements, both tactical and technical, to which the new arm might be susceptible.

As things turned out, probably this was the best plan, for technically the French tanks, at least, were susceptible of any amount of improvement, while the tactics employed before 1918 left much to be desired. The disadvantage of partial and indecisive action was that it gave the secret away to the enemy long before the Allies were in a position to use the new arm decisively. Fortunately, although he was able to more or less perfect his anti-tank defensive tactics, he had not the time to accumulate tanks of his own in sufficient number to make much use of them in 1918, and what he had were too big, although, for the matter of that, monster tanks were in contemplation on the Allied side when the Armistice put an end to hostilities. The idea of a light and very mobile tank does not seem to have occurred to him.

The French inventors saw with disgust the intervention of a few British tanks on the Somme in September, 1916, for they thought it a mistake to give the secret away before a decisive attack could be prepared. Perhaps it was fortunate, upon the whole, that appropriate tactics were never employed by either British or French until the Cambrai affair of November, 1917. It was then too late for the Germans to profit by the object-lesson of what massed tanks attacking by surprise could do.

THE FRENCH INVENTORS.

Although Monsieur J. L. Breton, Deputy, who was Under-Secretary of State for Inventions in M. Painlevé's Government and is now Health Minister in the Government of M. Millerand, was the first to apply the caterpillar traction to an apparatus for breaking through the enemy's barbed wire entanglements, there is conclusive evidence that General Estienne was the real inventor of the French *char d'assaut*, or *char blindé*, as the "tank" is now officially designated.²

¹ Marshal Joffre seems to have been more favourable to the "tank" idea than were his immediate assistants; but it was not till after the Cambrai object-lesson at the end of 1917 that the French Staff really recognized how tanks should be employed on the offensive.

² The personnel of the French Tank Corps are known now as the *Chasseurs blindés*.

M. Breton would seem to have been under the impression that it was his *tracteur porte-cisaille*, officially known as *engin à caterpillar pour la destruction des réseaux*, or shortly as *tracteur Breton*, of which design ten were ordered from the Schneider Company (Creusot) on December 7th, 1915, that had given Colonel Estienne (as he was then) his idea of an armoured car propelled by the caterpillar apparatus. This misconception may have been due, in some degree, to the fact that, by order of General Galliéni, Minister for War, when in February, 1916, Colonel Estienne's tank design was approved (and in consequence the orders for ten *tracteurs Breton* had to be cancelled), the manufacture of these new engines was camouflaged by calling them *tracteurs Estienne*.

Quite independently, M. Breton and Colonel Estienne had been working at the same problems, much as the British and French authorities had worked ever since the war began; but as a soldier, Colonel Estienne had the advantage of M. Breton, whose mind was fixed on overcoming one particular material obstacle and not on the tactical problem as a whole. Nevertheless, the latter did magnificent work throughout the war, both in advocating the provision of tanks and the correct method of employing them—by surprise.

A brochure published in 1918, entitled *Les Chars d'Assaut*, by M. Raoul Mortier,¹ states his case, and a very good case it is, for indefatigable efforts towards breaking the enemy's front by material means; but to assert that he, M. Breton, was both the initiator and the *réalisateur* of the French tanks is going altogether too far in *ex parte* pleading. In perfectly good faith, no doubt, but contrary to what is now established fact, as will presently be shown, Colonel Estienne's part in the realization of the French Tank Service, *artillerie d'assaut* as it was then called, is described in this pamphlet on page 21 as follows:—"A fresh trial (of the *tracteur Breton*) took place at the Satory Camp (near Versailles) on the 27th December, 1915, at which were present M. Painlevé, Minister of Public Instruction and of Inventions, . . . Colonel Estienne and several British officers. It was after this trial that Colonel Estienne, the future great head of the *artillerie d'assaut*, convinced by the experience he had just witnessed of the efficacy of these engines, succeeded after persevering and vigorous efforts, in overcoming the objections of the G.Q.G. and in obtaining approval of a programme for their manufacture on a considerable scale."

It may be noted in passing that it was not the *tracteur Breton* that was approved for manufacture in large numbers, but the *tracteur Estienne*. But the following letter, given on page 28 of "*Sous l'Armure*,"² by Pierre Lestringuez, *Lieutenant à l'Artillerie d'Assaut*, dated December 1st, 1915, that is to say, a week before the *tracteur Breton* was approved for trial and nearly a month before it was tried at Satory Camp, shows clearly that Colonel Estienne's design was entirely independent of, if not distinct from, that of M. Breton. The American Holt caterpillar tractor was

¹ Dunod et Pinat, Quai des Grands Augustins, Paris.

² La Renaissance du Livre, Bd. St. Michel, Paris.

indeed the basis of both, but Colonel Estienne had seen this long before M. Breton heard of it, on account of its use by the British Army for the movement of heavy guns, and Colonel Estienne's design was from the first an armoured car.

" Mericourt-sur-Somme, 1st December, 1915.

" From Colonel Estienne to the General Commander-in-Chief.

" Object—Request for an interview.

" In the course of the past year I have had the honour to call your attention, on two occasions, to the question of employing mobile armoured constructions for the purpose of assuring the progress of infantry.

" During the late attacks the incomparable value of this procedure struck me with increased force, and after a new severe analysis of the technical and tactical conditions of the problem, I consider the realization of vehicles possible with a mechanical traction capable of conveying infantry through or over obstacles, under fire, with arms and baggage and with guns, at the speed of nearly four miles an hour (six kilometres).

" I consider that it would take six months and ten millions (of francs) to produce material necessary for the transport of twenty thousand men, force sufficient to capture by surprise successive positions on a front of twenty-five miles (forty kilometres), allowing of the interruption of reserves formed in rear. Such an enterprise necessitates absolute secrecy and the prompt realization of a first vehicle, conditions incompatible with discussions on a Committee of Examination.

" In order to succeed I want only one thing, General, your confidence; and this I hope you will give me if you are willing to allow me to share with you my confidence, which is that of a careful *technicien*, as well as my ardent faith (in the efficacy of the invention) as a soldier who has been in contact with the realities of the war since its beginning.

(Signed) " ESTIENNE."

An interview with General Janin¹ followed, and 400 cars were ordered in February, 1916, of a design drawn by M. Brillé, one of the Creusot engineers, in collaboration with Colonel Estienne. These cars were the *tracteurs Estienne* of General Galliéri, referred to above.

On December 12th, General Janin only gave him (Colonel Estienne) leave to go to Paris, where, however, he saw M. Brillé. Meanwhile M. Breton was doing good work by demonstrating the advantage of caterpillar traction, and although the invention of the armoured car was clearly due to the soldier, M. Breton's experiments with the American mode of traction for agricultural vehicles over bad and broken ground (which method both soldier and civilian had independently

¹ Deputy Chief of Staff.

adopted), doubtless tended to obtain the approval of the G.Q.G. for its immediate manufacture. Before the War, Colonel Estienne (promoted General in July, 1916) had established a reputation as an inventor. A good mathematician, he had passed fifth into the *Ecole Polytechnique*, the preliminary step for every French officer of engineers and artillery. As a lieutenant of the latter arm he became, in 1890, a fervent advocate of indirect laying. For five years he struggled with the more conservative tendencies of his superiors, who distrusted the use of delicate instruments in the field; but the year 1895 saw the complete triumph of his ideas. As captain, he invented phonetic telemeters, permitting instantaneous resolution of the telemetric triangle by telephonic communication between two posts.

In 1909, as lieutenant-colonel, when directing the Grenoble School of Artillery, he was consulted with regard to the possibilities of aviation in connection with field artillery. He established a training camp at Vincennes with an annex at Châlons, and proposed the creation of a service of aviation in field artillery regiments. Unfortunately, his scheme, for some reason, failed to meet with War Office approval at the time and fell through. In 1913, however, when too late, as events proved, Estienne, now Colonel and Officer of the Legion of Honour, was called upon by the Inspector-General of Aeronautics to take the matter up again.

In 1914, his invention of an *avion-démontable* for transport with a regiment or battery, was experimented with at an artillery practice camp with the greatest success, but the war came before it could be approved and issued for general service. Only his two models were available, and these he took into the field himself, attached to his own regiment, the 22nd Artillery, with two officer pilots. In Belgium, during the retreat and at the Battle of the Marne, where Colonel Estienne commanded the artillery of the 6th Division, under General (now Marshal) Pétain, this small artillery aviation service played quite an important rôle, so much so that it was generally considered that had all the French field artillery regiments been furnished with *avions-démontables*, as Colonel Estienne proposed on May 1st of this same year, the effect of the celebrated .75 would have been doubled.

It will thus be seen that from his first entrance into the Army, in 1884, till 1914—thirty years—General Estienne's mind had almost always been occupied with inventions. It was only natural, therefore, that during the painful retreat from the Sambre to the Marne, his mind should turn once more to the question of military invention—whether mechanical means could not be found for facilitating the attack of the French infantry against an enemy bountifully provided with heavy artillery and machine guns. "Whoever shall first be able to make land ironclads, armed and equipped, roll over that," pointing to some heavy damp ground they were passing by, "will have won the war."

This speech was the result of his deliberations in September, 1914, just before the Battle of the Marne, and although he remained at the

front and was in command of the artillery of an Army Corps at Verdun at the beginning of 1916, the subject occupied all his spare moments until the war was won. His services were recognized three months before it ended by promotion to be Commander of the Legion of Honour, with the following *citation*: "Officier général d'une intelligence et d'une valeur exceptionnelle, qui par la justesse et la fécondité de ses idées, l'entrain et la foi avec lesquels il a su les défendre et les faire triompher, a rendu les plus éminents services à la cause commune Aussi brave soldat que technicien de tout premier ordre, peut être fier de son œuvre. (Croix de Guerre)."—*Journal Officiel*, August 10th, 1918.

This mention, too long to quote in full, also quite rightly gives General Estienne credit for a large part of the success of July 18th and following days.

THE MATERIAL AND ITS EVOLUTION.

The Char d'Assaut Schneider.—This was the first tank turned out. It was the "*tracteur Estienne*," and did nearly all the work in 1917

It was quite different from the British engine in appearance, being an armoured car placed on a caterpillar tractor, instead of a parallelepipedic shaped tank—certainly more like a tank than a car—with the caterpillar arrangement going all round it.

Moreover, this and all the other French *chars* had a sort of snout, through which the gun fired. In practice this was found a disadvantage. Soft earth clogged under it, especially in crossing trenches, and brought the Saint-Chamond car to a standstill. It was thought that this prow would aid in breaking through barbed wire entanglements, but in practice the Renault of 6½ tons was quite heavy enough to smash through any wire entanglement. So that the prow, which was much more pronounced in the Saint-Chamond than in the Schneider, besides being a disadvantage, was wholly unnecessary. This rough sketch may give an idea of what a Schneider *char* was like to those who have not had an opportunity of seeing one.

The Saint-Chamond was very similar in appearance, except that it was longer on account of its long (and heavy) snout or prow. It weighed nearly ten tons more than the Schneider. Both were classed as medium tanks. The weight and dimensions of the Schneider were, in feet, as follows:—19.685 long, 6.562 broad and 8.448 high; weight 13½ tons. Speed, with a 60 h.p. motor, between two and three miles an hour. Crew, one officer, one N.C.O. and four men.

There was no electric control in the first 400 of these machines.

The Saint-Chamond *char d'assaut*, 400 of which were ordered about the same time as the Schneider—in the first quarter of the year 1916—was of a more elaborate design. All authorities agree that had more time been given to the details of its construction, it might have been a very formidable war engine from the first; but its manufacture was hurried, apparently with the idea of competing with and eclipsing the Schneider—looked upon as the soldier's *char*—by a scientific War Departmental design.

M. Breton, we have seen, was sore on the question of the Schneider invention, and the military head of the Automobile Service thought that he ought to have a good deal to say in the matter, because the *embryo artillerie d'assaut* was officially under his direction.

The Inventions Committee, of which M. Breton was chairman, also had to justify its existence, and between them all, M. Albert Thomas, the Armament Minister, was induced to order 400 *chars à transmission électrique* from the *Société des Forges et Acières de la Marine*, of Homécourt-Saint-Chamond, without even informing Colonel Estienne of his intention.

M. Breton, writing to M. Albert Thomas on March 29th, 1916, declared that the "*caterpillar de Saint-Chamond à transmission électrique est maintenant absolument au point et donne toutes les garanties possibles de parfait fonctionnement*," and M. Thomas in his reply stated that the 400 Saint-Chamond *chars* were already ordered.

It was poor satisfaction to General Estienne that on March 31st, 1917 (just before General Nivelle's great, but unfortunately abortive, offensive), at the Tank Camp at Champlicu, there were thirteen Groups of Schneiders and but two Saint-Chamond: 208 to 32. The reason for this was that while the design of the *char*, under the supervision of Colonel Rimailho (the inventor of the only modern French heavy gun in 1914 of 6-inch calibre) was excellent in almost every respect, the caterpillar arrangement, by which it was to be made automobile, was too short and consequently useless. In order to save time the engineers of the company had tried to adapt the Holt tractor caterpillar and the result of this over-haste was to practically immobilize the tank for over two years, as after various attempts to alter and improve it, the whole caterpillar had to be manufactured anew.

The dimensions of the Saint-Chamond *char d'assaut* were, in feet, as follow:—25.952 long, 7.927 broad, and 7.7 high.

It was fitted with a dynamo for electric control and the motor was 90 horse-power.

Its armament was one .75 mm. gun, long—the ordinary field gun—and four machine guns.

Weight, nearly twenty-four tons and speed eight kilometres or five miles an hour.

The Saint-Chamond crew consisted of one officer, one N.C.O., and six men.

The electric steering gear was so satisfactory that it was added to all the later Schneider cars.

It seems at least doubtful whether the French would ever have invented a tank at all, independently, as it was the British Holt tractors for moving heavy guns that gave them the idea.

It was indeed fortunate that in Colonel Estienne they had a skilled soldier and technician combined, who was on the look-out for the very thing. Had it not been so M. Breton's wirecutter with caterpillar traction would have been the French war-chariot in 1916, when our strange looking but very practical land ironclads made their first appearance.

Under General Estienne's direction and on his initiative,¹ the light Renault tank, *char-léger*, became a very distinct feature—6½ tons, it was half the weight of the British whippet—in the last six months of the war, and had much to do with the first success and final victory of the Allied cause in 1918.

After considerable delay, as usual with committees (some members being hostile to the Renault firm, others insisting that the occupants of so small a *char* would be asphyxiated, or that it would not be able to break through the wire entanglements), the Under Secretary of State for Inventions (M. Breton) tried the Renault on April 9th, 1917, and passed it as satisfactory. One thousand one hundred and fifty *chars-légers* were ordered from this firm, 650 with cannon of .37 mm. and 500 with machine guns.

At the beginning of 1918, 4,000 additional *chars-léger* were under order:—1,000 with machine gun, 1,830 with .37 mm. gun, 200 signal

¹ Letter of November 27th, 1916, to Commander-in-Chief.

T.S.F. (wireless), 970 reserves (possibly some few cars by other makers were included under this heading). The steel blindage of the French tanks was nearly $\frac{3}{4}$ -inch, against $\frac{1}{2}$ -inch for the British.

The dimensions of the *char d'assaut* Renault, of which the foregoing is a very rough sketch of its appearance (it had the caterpillar traction at its sides), were, in feet, as follows:—13.45 long, 5.54 broad and 7.02 high. Weight with machine gun $6\frac{1}{2}$ tons, and a little more with the 37 mm. gun. Crew, one officer or N.C.O. and one man. The gun, or machine gun, was placed in the central turret, the post of the commander, who was also the gunner or machine gunner. Ventilation was assured by the overlapping hood of the armoured tower (*capot rabattable*). At the feet of the commander sat the driver. Profiting by experience, painfully gained, the reservoirs of oil and essence, with all the machinery, were placed in the back part of the *char* cut off from the crew by a sheet iron partition with holes in it which could be closed by two slides when desired. The object of the tail was to prevent the vehicle from upsetting. Speed on flat ground six miles an hour. The Renault motor develops 35 horse-power. As this little tank was unable, as a rule, to cross trenches of five feet width, but could do so by following in the track of a bigger one, it was decided, when it came to organization, to have both light and medium tanks in the same regiment.

The American Government adopted the Renault and large numbers were in course of manufacture in the United States when the Armistice put an end to the fighting. In the war, the Americans had to use French and British material. Their heavy tank of forty tons, somewhat similar in form to our Mark IV., under construction at Chateauroux, was not ready in time.

Only medium and light were therefore used by the Allies, but a monster for the French Army was under order in the Seyne chantiers at Toulon, thirty-six feet long and weighing sixty-five tons. The reason for this was that, although the *char-léger* had proved its value in offensive combat, the enemy's anti-tank defence had become too serious. General Estienne considered that a new tank was necessary, which besides having a powerful armament could cross all obstacles. The French took over 300 of our Mark V* (carriers), for employment as fighting tanks, in October, 1918.

The German *Elfriede* was a heavy tank of forty-five tons, but the enemy made more use of British tanks captured and repaired.

It is rather curious to note that while acknowledging the great superiority of the British engine over their own medium *chars*, yet when it came to ordering a heavy tank, unlike the Americans, the French discarded the British form—which was certainly very ugly; perhaps that was the reason¹—and adopted the Renault design.

¹ It has been said by a Frenchman that "the English make things *bon*, the French *bon et beau*, and the Germans *mauvais et laid*."

The French heavy tank of sixty-five tons would have been in appearance simply their *char-léger* magnified ten times.

The French classify tanks in three categories :—

- (1) *Char-léger*, under ten tons.
- (2) *Char medium*, ten to thirty tons, which can be transported in railway trucks.
- (3) *Char lourd*, which to be moved by railway would require a special truck.

The Germans are reported to have had one building of 128 tons.

ORGANIZATION.

Up to March 21st, 1918, Champlieu, near Compiègne, was the principal instruction camp of the French *Artillerie d'Assaut* and the headquarters of General Estienne. Cercottes was the principal dépôt only, until the above date, when everything had to be transferred there from Champlieu that could be moved, on account of the German advance in the Oise Valley and towards Amiens.

Just a year before, in March, 1917, there were at Champlieu under instruction thirteen *Groupes* of Schneiders and two of Saint-Chamond. Each *Groupe* was then supposed to consist of four batteries and each battery of four *chars* : sixteen *chars* in all, with a personnel of 18 officers, 18 N.C.O.'s and 74 rank and file for a Schneider, or 106 for a Saint-Chamond *Groupe*. But after the April offensive, the *Groupe* consisted generally of only three batteries, and the Saint-Chamond battery of three *chars* instead of four. A group commander's rank was usually that of captain.

A *Groupement*, the next higher unit for medium *chars*, comprised a certain number of *Groupes*, four Schneider or three Saint-Chamond to begin with, and less afterwards owing to losses, to which was added a Section S.R.R.,¹ for repair and renewal in the field of slight damage. An echelon S.R.R. accompanied each *groupe*.

The *chars-léger*, being regarded as exclusively an infantry arm, this service was organized in companies and battalions. A battalion comprised three companies, a company three sections, a section five *chars de combat*.

Each company had, in addition to its three sections, an *échelon de combat* of ten reserve *chars*, including a signal (wireless) and a C.O.'s *char*, total seventy-five, and the personnel consisted of 5 officers, 15 N.C.O.'s and 115 rank and file. The reserve was added to ensure the immediate replacement of *chars de combat* disabled.

Owing to the delay, already mentioned, in ordering the *matériel*, the first company could not begin training at Champlieu till January, 1918. Three battalions were sufficiently trained in June to take an invaluable part in checking the enemy's advance at the eastern boundary of the Forest of Villers Cotterets.

¹ *Section de Reparation et Ravitaillement.*

REGIMENTS AND BRIGADES.

Regiments of *Artillerie d'Assaut* (A.S.), which organization was begun in May, 1918, with the dépôt regiment, 500 d'A.S., at Cercottes comprised :—

- 1 *Groupement* of medium tanks (Schneider or Saint-Chamond) ;
- 3 battalions of *chars-légers* ; and
- 1 full section of S.R.R.

By September 1st, 1918, when eight regiments were ready, they were formed into brigades as follow :—

- 1st Brigade (Colonel Wahl).—502nd, 504th and 505th Regiments of A.S., with No. 2 Park at Mailly-Poivres.
- 2nd Brigade (Colonel Chédeville).—501st, 503rd and 506th Regiments of A.S. with No. 1 Park at Barbery (near Senlis).
- 3rd Brigade (Colonel Pierret).—507th and 508th Regiments of A.S. with No. 3 Park at Martigny-les-Bains (Vosges).
- Grand Park of A.S. at Bourron.

The Brigade and Regimental Commanders joined for the time being the Headquarter Staffs of the units, Army Group, Army or Army Corps, to which their respective commands were attached for duty.

At this period, September 1st, 1918, the French tanks were assembled and manœuvred in accordance with the advice, technical and tactical, of the superior officers of the arm, attached as we have seen to the Headquarters of Commands. Previously, especially in 1917, great difficulty and considerable loss had been experienced in assembling the tanks at their fighting positions, the Army or Army Corps Staffs persisting, in spite of A.S. technical officers' protestations, in treating them as automobiles that could go any distance in preliminary movements by their own traction.

Probably the British tank pattern was more serviceable in this respect. General Sir John Monash relates how 168 tanks moved forward during the night for the offensive of August 8th, 1918, camouflaged as regards noise by innumerable planes flying low, which for several days before the battle promenaded the front. The result as regards the Australians was all that could be wished : 9,000 yards advance, 8,000 prisoners and 178 guns.

During the summer of 1918, Marshal Foch established at Recloses, near Bourron, an inter-Allied experimental camp, known as the *Centre interallié d'information d'Artillerie d'Assaut*, at which detachments of British, American, Italian and French troops were quartered, in order to take part in manœuvres with the British Mark IV., Mark V*, Whippet, and the French Renault engines.

The Schneider and Saint-Chamond, destined to disappear, were not represented.

The Italian projects, like the American, had not time to reach maturity before the Armistice, but at Recloses the Tank Staffs of each nation had the best of opportunities for consulting each other.

EMPLOYMENT.

One of the secrets of success with the *chars d'assaut* in the field was to employ them with infantry that had been specially trained to work with them, and another was, of course, to engage them by surprise in the van of an offensive, instead of behind in support of infantry after a long artillery preparation, as was at first the method erroneously adopted. Until 1918, they and their personnel were handed over to Corps Commanders and General Estienne had no voice in the tactics adopted.

The first time the French tanks came into action was during General Nivelle's abortive offensive of April, 1917. No attempt was made to effect a surprise with them. The idea governing their employment appears to have been to keep them in reserve for the purpose of attacking the enemy's second or third position. As a result, the *chars* had to advance in broad daylight and merely became good targets for the hostile guns.

The scene of this action was the country immediately to the north of Berry-au-Bac. Eight groups of Schneiders (128 *chars d'assaut*) were employed, divided into two parties, five groups under Commandant Bossut being attached to the 32nd *Corps d'armée* and three groups, under Commandant Chaubés, to the 5th *Corps d'armée*.

The object of the attack in which these groups were engaged was the capture of the enemy's new position between Berrieux and Neufchâtel-sur-Aisne, which faced south-south-west, at a mean distance of nearly six miles from Berry-au-Bac. Ville-au-Bois and the large woods south and east of this village divided the tanks in their preliminary deployment. The Bossut party on the right to the west of Caesar's Camp, and that of Chaubés, having crossed the Aisne at Pontavert (about four miles west of Berry-au-Bac), with its left on the Bois de Beau Marais, a mile south of Craonne.

Of the eighty *chars* on the right, thirty-nine remained disabled in the German lines, and four disabled in the French lines.

Of the forty-eight on the left, twenty-three were destroyed by the enemy's artillery fire and fifteen others were disabled.

The enemy's second position had not been completely taken before the attack. The plateau of Craonne remained in his hands: a good observation post. Many *chars* took fire, caused by shells bursting inside and igniting the essence reservoir in the centre of the vehicle. Commandant Bossut was killed in one.

The reservoir was in consequence afterwards placed behind and outside.

After this affair (April 16th), 76 *chars* remained on the ground, 57 of which had been destroyed by the enemy's fire. Of the personnel, 34 were killed (9 officers), 37 missing (7 officers), and 109 wounded (17 officers). Nevertheless, these losses (twenty-five per cent.) were largely compensated, the Commander-in-Chief said, by lives saved in taking on the brunt of the fighting between the Miette and the Aisne on April 16th.

It was a valuable but costly lesson in tactics to the Army Corps Commanders, and in construction to the technicians.

Two Schneider Groups and one Saint-Chamond had been sent to the French Fourth Army, but did not come into action, as the enemy's second position was not taken. Later on, in May, this party, or *groupe ment* it might be called, advanced *with* the infantry instead of after it and did fairly well, with twenty per cent. casualties and only six *chars* left on the battlefield. But out of the sixteen Saint-Chamonds, only five came into action.

These details and most of those to follow are taken from Capitaine Dutil's exhaustive work "*Les Chars d'Assaut*."¹

Both he and the author of "*Sous l'Armure*," Lieutenant Lestringuez, were during the war Staff Officers of the A.S.

After these engagements, it was clear that the French tanks then in use required alteration and improvement, especially as regards the position of their spirit reservoirs. No *chars* were again engaged till October 23rd at Malmaison. Their reputation had suffered, from the failure of General Nivelle's offensive, with the French Ministers and members of the Inventions Committee, who might have lost faith in them had it not been for the activity and unshakable faith in the eventual success of these engines displayed by M. J. L. Breton. As early as December, 1916, he had deprecated long artillery preparations which rendered surprise absolutely impossible. More than a fortnight before General Nivelle's offensive, on March 29th, 1917, in a letter to the War Minister, he urged that the tanks should be given a chance by the observance of rational tactics with regard to them :—"You can employ artillery of assault with or without preliminary artillery preparation. At the present moment, only the first method is in favour. This is regrettable, as it is easy to show. When the A.S. simply follows the infantry that has taken the first position, the hour is favourable to field artillery. These conditions are precisely those unfavourable for the employment of *artillerie d'assaut*. The enemy, warned by several days of artillery preparation, will have sufficiently garnished his second position with guns and prepared flanking fire in readiness. Moreover, the *chars d'assaut* pass with great difficulty over ground that has been cut up by artillery fire. Far better attack (with tanks) from the beginning. By choosing favourable conditions—fog and absence of artillery preparation—several successive positions might be carried and the tanks reach the enemy's batteries without too much damage."

After the failure, M. Breton, then Under Secretary of State, was called before the War Committee of the Senate, to whom he explained the cause. "In the last offensive they made use of these engines in a manner that does not seem to me rational. In my opinion tanks ought to be engaged without previous artillery fire. They should be employed where the enemy does not expect them . . . by advancing they would

¹ Berger-Levrault, Paris

destroy the barbed wire entanglements and allow of the infantry penetrating the opposing lines."

There was sound sense in these remarks, which M. Breton never ceased to urge for nearly a year and a half before the French tanks were engaged. He was without doubt better inspired tactically with regard to the use of tanks than were the distinguished soldiers at the front to whom they were at first handed over.

It is not surprising that M. Breton is now a full fledged Minister in M. Millerand's Government—*minister de l'hygiene, assistance et de la prevoyance Sociales*—in which capacity his public utterances are distinguished equally by the sound sense enunciated:—

"The depopulation of France," he said recently, "was the great cause, the deep cause, of the world war. If our population had developed in a normal manner parallel to that of Germany, never would that nation have dared to let loose upon the world this terrible scourge."

THE MALMAISON OFFENSIVE, OCTOBER 23RD, 1917.

The object was to seize ground on the western flank of the Chemin des Dames, whence the enemy's lines on the Ailette could be enfiladed, and at the same time to deprive the enemy of posts of observation.

Again no special tactics for tanks, which were still treated simply as additional fighting material, like armoured cars. It required the Cambrai object-lesson of the following month, before the French generals would listen either to General Estienne or to M. Breton.

One *Groupe*ment Schneiders, 36 *chars* and 1 Section S.R.R.; one *Groupe*ment Saint-Chamond, 28 *chars* and 1 Section S.R.R., under the command of Lieut.-Colonel Wahl, were attached to the Sixth Army.

This offensive, very carefully prepared by Marshal Pétain with the view of raising the morale of the French soldier, who had shown some signs of losing heart after General Nivelles's failure, was a victory for the French infantry, assisted without doubt by those *chars* that were able to reach the enemy's second position.

Fourteen battalions had gone through a course at Champlieu and two battalions of *chasseurs-à-pied* had been trained to accompany the tanks, none of which took fire. One Saint-Chamond *char* took two batteries of field guns, and another, having stopped involuntarily on the top of a dugout, took from it fifteen prisoners.

But, generally speaking, as far as the tanks were concerned, the great preparations at Champlieu were nullified and rendered as naught by the absence of surprise and the impossible nature of the ground to be passed over after *six days' preliminary bombardment*. Very few tanks really came into action and only six therefore were put out of action by the hostile artillery and as the enemy retreated these, and two others left on the ground on May 5th, 1917, were recovered. Losses, ten per cent. of the personnel. One group of Schneiders could not come into action at all on account of becoming fixed in shell holes.

CHARS-LÉGERS' BAPTISM OF FIRE, MAY 31ST, 1918.

The desperate state of affairs in the direction of Villers-Cotterets after the German offensive of May 27th, and the collapse of the French defence from the Chemin des Dames to the Marne, necessitated the entry into action of the 6½-ton Renaults earlier than was intended and under conditions the exact opposite to all the teaching and training that had been going on since January 1st at Champlieu and Cercottes. The intention, approved by Marshals Foch and Pétain, had been to wait till a sufficient number of companies had been trained to allow of their intervention on a wide front. This intervention to be governed, tactically, by four principles:—

- (1) It should come as a surprise to the enemy.
- (2) The occasion should be an offensive one.
- (3) The advance (of the tanks) should begin at daybreak.
- (4) Mist, fog, or smoke should cover their first advance.

The enemy's push towards Villers-Cotterets, carried out without check for four days, menaced the communications of the French front north of the Aisne and promised to become disastrous if not brought to a standstill at the eastern edge of the Villers-Cotterets Forest. The danger forced the French to throw in all the light tanks available as a support to their hard pressed infantry.

Thus it came to pass that on the first occasion when these new engines were shown to the enemy, instead of a surprise at dawn, under cover of mist, by hundreds on a broad front, six sections (nominal strength thirty *chars*, but all do not seem to have been engaged) had to attack, east of Dommiers, on May 31st, at twelve noon, across a bare plateau exposed to the fire of the enemy's field artillery.

Nevertheless the *chars-légers* acquitted themselves well, and were fortunately not observed while crossing the bare plateau; but the counter-attack they were supposed to lead was a complete failure, due to the fatigue of the troops. The *chars* were attached to the celebrated Morocco Division, which was ready at twelve noon; but the attack of the division on its right had been postponed till two p.m. without the Morocco Division having been informed. For this reason, the right flank of the latter being uncovered, the *chars* had to return to their rallying point without the satisfaction of dislodging the enemy from his position; but they had inflicted considerable losses upon him and had left but three of their number in the hostile lines.

The six sections that took part in this affair, which, disappointing as it was, had notwithstanding the effect of checking the enemy's further advance, belonged to three battalions of *chars-légers*—the first three available—detached from Cercottes to aid in the defence of the Forest of Villers-Cotterets. During the greater part of June, these nine companies (twenty-seven sections) were engaged almost every day in most effective service, different certainly from what had been intended, but quite as important in giving heart to the infantry defence. Without the light

tank it is uncertain whether the Allies could have withstood the enemy's offensive movement towards Villers-Cotterets, which, had it succeeded, would have created a most serious situation with regard to the French capital and obliged the transference of the seat of the Government again to Bordeaux.

By June 22nd, seven companies had to be retired out of the sector for rest and refit. The infantry of the Sixth Army saw them depart with regret. Two companies (afterwards one company) were kept with this Army in reserve as a moral support to the infantry, ready to intervene if necessary.

The isolated counter-attacks of companies and sections, in co-operation with small bodies of infantry in the forest, or rather on the eastern edge of it, during the first three weeks of June, furnished useful experience to all concerned in both tactical and technical matters.

Medium tanks had much to do with General Fayolle's success in repelling the German offensive on June 9th in the Oise Valley and west of it, towards Compiègne. Two *Groupements*, 110 Saint-Chamonds and sixty Schneiders, took part and materially assisted General Mangin's counter-attack with four divisions.

THE ALLIED COUNTER-OFFENSIVE OF JULY 18TH.

The momentous counter-attack of July 18th, 1918, against the western face of the great salient, from the Aisne to the Marne, had been in preparation for three weeks, or more. Upon General Pétain reporting enemy preparations opposite Gouraud (French Fourth Army, east of Rheims), Marshal Foch decided to lay a trap for the attacker on that front, and to make a counter-attack of his own proposed offensive, after that of the enemy had failed. The Germans, from the neighbourhood of Soissons to Chateau-Thierry, were formed front to a flank and there was here an opportunity of bringing superiority of force to a decisive point, if only Marshal Foch had men and *matériel* enough at his disposal. The enemy thought he had not the means for an attack in force, an error which perhaps lost them the war.

Only six battalions of *chars-légers* were available, but some 250 medium tanks added to these made more than enough to lead the attack of the Army on the inner flank, the Tenth Army (Mangin), at the most important part of the offensive front.

Two <i>Groupements</i> Schneider	..	..	123
Two <i>Groupements</i> Saint-Chamond	..	..	90
Three battalions <i>chars-légers</i>	..	..	135 <i>chars de combat</i>
			<hr/>
			348

were distributed among the three first line *corps-d'armée* of General Mangin's Army and led the advance, from west of Dommiers through Longpont, to the Ourcq. The Sixth Army (Degoutte), carrying on the

line from the Ourcq to the Marne, had what tanks were over after thoroughly equipping the Tenth Army, viz., one *Groupe* Saint-Chamond of thirty tanks and three battalions of *chars-légers*, total 165.

On this great occasion, the tactics were those long advocated by M. Breton and General Estienne and actually employed at Cambrai

in the previous November. Surprise was complete. There was a slight fog, no artillery preparation and the hour of advance was 4.35 a.m.

Result, a progression of four miles, 12,000 prisoners and 800 guns captured.

The tanks suffered, especially the medium, which had 102 *hors de combat* and twenty-five per cent. of the personnel, but this time the sacrifice was not in vain. The initiative regained, largely if not entirely owing to the efficacy of these machines and to the skill and daring of the officers and men who manned them, was never surrendered. Victory followed victory. British, Italians, Americans, Belgians, as well as the French, taking heart of grace, became successively irresistible. Long before Marshal Foch then thought possible, the hitherto all-powerful invader was hurled back on the Rhine, with the choice of an immediate armistice on the Entente terms, or overwhelming disaster. Considering the provocation—ruthless barbarity for four long years—perhaps the Entente in allowing even this choice was too kind. But it is difficult to go on fighting a man when he lies down.

By July 29th, when the enemy's complete defeat was assured, all the French tank *matériel* in action had been used up, or retired to refit. A new battalion of *chars-légers* was railed direct from the Mailly instruction camp to join the Tenth Army, and on August 1st was doing effective work in enabling infantry to secure possession of the Grand Rozoy plateau on the (enemy's) left of the line of heights at Buzancy and eight miles to the east of it, which had cost the Tenth Army the last of its *artillerie d'assaut*. On July 23rd four companies of *chars-légers* lost forty-eight out of fifty-two engaged. A battery opened at fifty yards from one section, of course destroying it utterly.

On July 27th, a company of *chars-légers* was attached to the British 62nd Division, and two sections of another company are reported to have aided Scottish infantry to take Espilly and the Bullen Farm, in spite of the number of hostile machine guns met with.

In this battle and subsequently, the improved Schneiders and Saint-Chamonds surpassed all expectations, but only seventy-six of them were left at the front on September 1st, 100 on October 1st, and 105 on November 1st (fifty-one Schneider and fifty-four Saint-Chamond).

On the other hand seven regiments (21 battalions—945 *chars de combat*) of *chars-légers* were there on October 1st. Companies Nos. 334 and 336 in Flanders, after breaking the enemy's front, advanced eight and a half miles on October 17th, continually clearing away the rearguard machine guns.

The *chars-légers* generally continued to do splendid work up to the Armistice, when nine battalions with what was left of the medium tanks were assembled at Dieulouard and Lunéville, ready to lead the great flank movement of two Armies under General de Castelnau, which would have cut the German left from the Rhine bridges and produced another Sedan, but with compound interest.

Thus, the light tanks had not only fully justified their existence, but falsified General Estienne's fears that the German anti-tank defence would in time master their offensive action. The Renault 6½ ton *char-léger*—three-fifths of those manufactured carrying guns and two-fifths

machine guns—remained perhaps the greatest invention of the war, which thanks in great measure to its help, was finished long before the heavy monsters of sixty-five tons, under manufacture at Toulon, saw the light of day. Away from entrenched lines, the mobile and easily manœuvred Renault, offering a comparatively small target to artillery, was invaluable. But in preparing for the possibilities that the future hides, the fact that a 6½-ton tank, in order to cross trenches more than five feet wide, requires a medium tank to precede it, must not be lost sight of.

The following is taken from Lieut.-General Sir F. W. Hamilton's "History of the Grenadier Guards," Vol. II., pp. 274-5.

THE FIRST REGIMENT OF FOOT GUARDS.

1793. The use of light infantry troops had for some time been established in continental armies, and during the stay of the Guards at Dordrecht, towards the end of March, one light infantry company was formed; composed of picked men from the three battalions of the brigade, each battalion furnishing twenty-seven men; the officers were also selected from the service battalions, and the command of this company, which was attached to the Grenadier battalion of four companies, was conferred on Lieutenant-Colonel Perryn of the First Guards, who had already seen service in America, his place and those of the other officers being filled up by officers of corresponding rank from the battalions at home. Nearly simultaneously with the formation of the above temporary brigade company while on active service, an order was issued in England, on the 16th of April, by the King's command, for raising four light infantry companies for the First Regiment of Guards, each of one captain, two lieutenants, two buglers, and 100 rank and file, and two of like strength for each of the other two regiments. As many of the officers who were to receive commissions in those companies were then with their battalions abroad, the Duke of York ordered them to be relieved by others upon the first opportunity, and return home.

The following were the officers selected in April for the four light infantry companies of the First Guards :—

Captains and Lieut.-Colonels.		Lieutenants and Captains.	
Lt.-Colonel	Thos. Glyn.	Capt.	Rob. Cheney,
"	Hon. G. J. Ludlow.		Denzil Onslow.
"	Will. Thornton.	"	H. Clinton,
"	Duncan Campbell.		Hon. A. Hope.
		"	Jn. Gosling,
			Hon. Jn. Broderick.
		"	M. Disney,
			H. F. Campbell.

These companies were actively trained for their new duties under proper instruction at home, and in July two of those of the First Guards, and one from each of the two other regiments, were sent out to Holland.