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CONTENTS.

	Page.
1. Review of the Operations of the Belgian Army, 31st July to 31st December, 1914. (By the General Staff of the Belgian Army). Major W. A. J. O'MEARA, C.M.G., <i>p.s.c.</i> , late R.E. (Barrister-at-Law of the Inner Temple). (With Plate) ...	225
2. Improvements in Camp Equipment. By 2nd Lieut. E. J. MCKAIG, R.E. (T.F.), A.M.I.C.E. ...	255
3. Sieges and the Defence of Fortified Places by the British and Indian Armies in the XIXth Century (<i>continued</i>). By Col. Sir EDWARD T. THACKERAY, V.C., K.C.B., late R.E. : The War with China, 1860 ...	257
4. Sun-Bearing Diagram. By Capt. JAS. MCEVOY, Canadian Engineers. (With Plate)	265
5. Notice of Magazine ...	266
6. Books Received...	272

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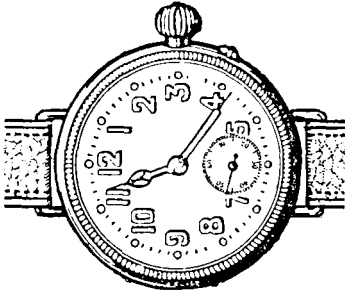
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CONTENTS.

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CONTENTS.

	PAGE.
1. REVIEW OF THE OPERATIONS OF THE BELGIAN ARMY, 31ST JULY TO 31ST DECEMBER, 1914. (BY THE GENERAL STAFF OF THE BELGIAN ARMY). Major W. A. J. O'Meara, C.M.G., <i>p.s.c.</i> , late R.E. (Barrister-at-Law of the Inner Temple). (<i>With Plate</i>)	225
2. IMPROVEMENTS IN CAMP EQUIPMENT. By 2nd Lieut. E. J. McKaig, R.E. (T.F.), A.M.I.C.E.	235
3. SIEGES AND THE DEFENCE OF FORTIFIED PLACES BY THE BRITISH AND INDIAN ARMIES IN THE NINETEENTH CENTURY (<i>continued</i>). By Col. Sir Edward T. Thackeray, V.C., K.C.B., late R.E. : The War with China, 1860	257
4. SUN-BEARING DIAGRAM. By Capt. Jas. McEvoy, Canadian Engineers. (<i>With Plate</i>)	265
5. NOTICE OF MAGAZINE :— <i>Rivista di Artiglieria e Genio</i> . By Col. Sir Edward T. Thackeray, V.C., K.C.B., late R.E.	266
6. BOOKS RECEIVED	272

Authors alone are responsible for the statements made and the opinions expressed in their papers.

*REVIEW OF THE OPERATIONS OF THE BELGIAN ARMY,
31st JULY TO 31st DECEMBER, 1914. (BY THE
GENERAL STAFF OF THE BELGIAN ARMY).*

MAJOR W. A. J. O'MEARA, C.M.G., *p.s.c.*, LATE R.E.
(Barrister-at-Law of the Inner Temple).

THE valiant deeds performed by the gallant little Belgian Army in defence of hearth and home and in the attempt to obtain respect for the status of a neutral imposed upon its country by treaty stipulations will live in the memory of man for all time and cannot fail to evoke the highest admiration so long as a spark of the spirit of chivalry exists in this world. It is yet too early in the day for a critical history to be written of the part played by the troops of any of the combatant nations, even in relation to the events a year ago, but a bare recital of the movements carried out in the first days of the War by the troops taking part in the present titanic struggle can, however, well be placed on record at this date; such a record concerning the doings of King Albert's troops during the first five months of the War, 31st July to 31st December, 1914, has recently been published, in the form of a report, by the General Staff of the Belgian Army, under the title "*L'Action de l'Armée Belge pour la Défense du Pays et le Respect de sa Neutralité.*"* This report consists of nine exceedingly short chapters, accompanied by sketch maps; the latter, of which there are 11, are bound into the volume in a very convenient manner so that the reader can have each map in view above the letterpress relating to the events affecting the region depicted therein. The map of Antwerp (No. 8) is reproduced by the kind permission of Messrs. W. H. & L. Collingridge, City Press, 148 & 149, Aldersgate Street, E.C. The Book should command an extensive circulation.

Preliminary Details.—The first chapter deals with the preliminary details connected with the Belgian preparations for war. It is stated that, war having become imminent, three classes of the Militia were recalled to the colours so as to bring the establishment of the Army to the footing known as "*paix renforcée.*" This step was necessary because Belgium being a country small in extent its whole territory constituted a frontier zone and the entire Belgian Army was but a "*corps de couverture.*"

When war broke out a commencement had only just been made with the reorganization of the Belgian Army, recently

* W. H. & L. Collingridge, City Press, 148 & 149, Aldersgate Street, E.C.

authorized by the Legislature, which provided for an increase of the war establishment up to a total of 350,000 men. However, as this establishment could not be raised to the total named till 1918, the Ministry had approved a scheme which made provision for the mobilization and concentration of the Army (which was totally unprovided with heavy artillery), during the interregnum period, in accordance with the plans made for the defence of Belgium.

Events marched rapidly in July, 1914, and on the 31st *idem* the then exceptional gravity of the European situation rendered it necessary to mobilize the Belgian Army at once; the proclamation ordering mobilization was consequently issued at 7 p.m. on the date last mentioned.

In peace time, the Belgian Army occupied quarters as follows :—

1st Division (Headquarters Ghent) : Ghent, Bruges, Ostend and Ypres.

2nd Division (Headquarters Antwerp) : Antwerp.

3rd Division (Headquarters Liège) : Liège, Hasselt and Verviers.

4th Division (Headquarters Namur) : Namur and Charleroi.

5th Division (Headquarters Mons) : Mons, Tournai and Ath.

6th Division (Headquarters Brussels) : Brussels.

The Cavalry Division was stationed in and about Brussels.

The centres for the concentration of the Belgian Army had been chosen with a view to the fulfilment of the obligations imposed on Belgium in 1839 to remain a neutral state; thus, the 1st Division (or Flanders Division) was in observation to meet any hostile intrusion on the part of British troops; the 2nd Division (or Liège Division) was in position to bar the advance of German troops into Belgium; whilst the 4th and 5th Infantry Divisions were drawn up to oppose a French invasion, the 4th Division being intended to repel an attack on Namur and the 5th Division a French advance from the line Lille-Maubeuge.

The task assigned to each of the four divisions last named was that of holding an invader attempting to penetrate Belgium by the sector of defence for which the division was responsible, until such time as the remaining five divisions could be brought into the territory immediately threatened by hostile forces.

The defence of the fortresses of Antwerp, Liège, and Namur was entrusted to the seven oldest classes of Militia; this left the eight classes of the Militia most recently trained for service with the field army.

The measures adopted in Belgium up to date had, as stated by the Belgian Minister of Affairs in a communication to the diplomatic representatives of Belgium at foreign courts, for their sole object the purpose " of putting Belgium in a position to fulfill her international obligations: they were in no way inspired by a spirit of defiance towards any single power."

At 7 p.m. on 2nd August, whilst the mobilization of the Belgian Army was in progress, the German Ambassador at Brussels handed the now famous Note demanding an unopposed passage through Belgium for German troops, then ready to march to the northern frontier of France, a reply to this demand was required by the midnight following.

Two passages in this Note were of significance from a military point of view :—

- (i.). The German Government alleged that it had received absolutely reliable intelligence that French troops were about to advance by Givet and Namur on to the line of the Meuse.
- (ii.). It was further alleged that measures necessary for the safety of the German Empire made it imperative for the Imperial troops to march through Belgian territory, and a demand was made that Belgium should offer no resistance to these troops, notably at the fortified places on the Meuse, by the destruction of roads, railways, tunnels, or other engineering structures.

The Belgian Government did not cease its defence preparations on the receipt of this Note ; on the other hand, orders were issued to the Belgian units on the frontier to open fire on any foreign troops attempting to violate the neutrality of the State. The Belgian Government had at the same time replied to the German Note stating definitely that “ it would repel by every means in its power, any attempt whatsoever made by Germany on the sovereign rights of Belgium ” ; and further that “ if contrary to all expectations, a violation of the neutrality of Belgium should by chance be effected by France, Belgium would fulfill all international obligations imposed upon her and her army would offer the most strenuous opposition to this invader.” At the same time an offer of military assistance from the French Ambassador in Brussels was declined, owing to the fact that no general appeal had up to that time been made by Belgium to the guaranteeing Powers.

During the night of 3rd—4th August, intelligence was received which left no doubt whatever that German troops were about to force a way for themselves through Belgian territory. In consequence, the Belgian General Staff ordered the destruction of bridges on the lines of advance likely to be used by the German Army, and the Military Governors of the various districts were informed that under the circumstances then existing the entry of French troops into Belgium was no longer to be looked upon as a violation of neutral territory.

The progress of events imposed on the 3rd (Belgian) Division the duty of bearing the brunt of the first blows about to be struck against the liberty of the Belgian nation ; steps were immediately taken to

move forward the 1st (Belgian) Division from Ghent to Tirlemont; the 2nd (Belgian) Division from Antwerp to Louvain; the 5th Division from Mons to Perwez; the 6th (Belgian) Division from Brussels to Wavre. The 4th (Belgian) Division remained at Namur for the mobile defence of this fortress. The foregoing movements were covered by the Belgian Cavalry Division which, having concentrated at Gembloux, was pushed forward to Waremme, by a mixed brigade of the 3rd (Belgian) Division occupying Tongres and by a mixed brigade of the 4th (Belgian) Division moved to Huy for this purpose; this concentration of the Belgian Army, which was effected partly by road and partly by rail, was completed on the 5th August; in accordance with the terms of the Constitution of Belgium the supreme command of the forces in the field was at once assumed by King Albert. On the day following, the whole Belgian Army had been provided with its full transport and was ready to execute any move ordered.

On a war footing each division of the Belgian Field Army constituted a self-contained unit, consisting of from three to four mixed brigades, one regiment of divisional cavalry, one regiment of divisional artillery, one battalion of engineers (two companies), a field telegraph section, one divisional supply column. Each mixed brigade was composed of two infantry regiments (of three battalions each), a brigade of artillery (three batteries), a machine-gun company, and a platoon of gendarmerie. The Cavalry Division comprised two cavalry brigades, one cyclist battalion, one horse artillery brigade (three batteries), one cyclist-pioneer-bridging company, one divisional supply column. The total strength of this Field Army was 117,000 men, to which were added later 18,500 volunteers.

After the German troops had violated Belgian territory, King Albert's Ministers addressed a Note to the guaranteeing powers in which was expressed the intention of the Belgian nation to resist the German intrusion, and these powers were asked for their co-operation to assist Belgium to maintain her independence and the integrity of her dominions. The Ministers stated in this Note: "Belgium is in a position to furnish an assurance that she will defend her fortified centres."

It was realized in Belgium from the tenour of the German Note of the 2nd August that, if the German armies must pass through Belgian territory, the Meuse would by no means fix the limit of ingress into Belgium, but that the river line would merely be the base from which would be launched the offensive movement against France, an offensive in which German troops would take part in strength far superior to anything Belgium could oppose to them.

In consequence, the following principles were laid down as a guide for the action of the Belgian Army:—

I. In the event of the Belgian Army having to meet forces far superior to itself :

- (i.). It was to hold on to its ground, by occupying good defensive positions barring the lines of advance open to the enemy ; the object in view being to cover as great an extent of territory as possible against invasion.
- (ii.). The Belgian Army, forming as it were an advanced guard to the French and British forces, was to await in the positions taken up by it the arrival of the armies of these Allies.
- (iii.). If it became impossible to effect a junction between the Belgian Army and the troops of France and Great Britain owing to the earlier arrival of large masses of enemy troops, the Belgian troops were not to run the risk of severe loss, involving in any case a surrender of territory, and consequently—
 - (a). The Belgian Army was on no account to deliver an attack single-handed against superior masses.
 - (b). The Belgian Army was to prevent itself from being enveloped ; indeed on the contrary, it was so to act as to secure its line of communications with a view to forming ultimately a junction with the French and British forces for the purpose of acting in co-operation with them.

II. In the event of the Belgian Army having to meet forces equal only in strength to itself :

It was to attack the enemy at the most favourable opportunity, that is in the event of the positions occupied being too extended, insufficiently organized, etc.

In both cases the Belgian Army was called on to defend Liège, Namur and the entrenched camp of Antwerp. The events which occurred on the Meuse and before Liège in the early days of August rendered it necessary for the Belgian General Staff to reconsider completely their plans and to modify them to a very considerable extent.

The Defence of the Fortified Position of Liège.—The second chapter deals briefly with the early combats near Liège and the German assault on the defences of this centre. On the 4th August, two German Cavalry Divisions (the 2nd and 4th, comprising about 12 regiments) had crossed the Belgian frontier and invaded the Herve district. These Cavalry Divisions made direct for Visé and on their arrival there found the bridge across the Meuse destroyed. The 2nd Battalion of the 12th (Belgian) Infantry Regiment had been posted at this point to deny the passages across the river to the enemy ; this battalion held in check the superior force of German

cavalry in front of it, although the latter was quickly supported by artillery and infantry pushed forward in motor vehicles. However, two regiments of German Hussars crossed the river lower down by the ford at Lixhe ; realizing that their flank was turned, the Belgian infantry retired into Liège.

Behind the German cavalry referred to there marched a force of all arms belonging to the VII., VIII., IX., X. and XI. German Corps ; this German force advanced rapidly into Belgium and by midday of the 4th August had reached the line Bombaye-Herve-Remouchamps. At the same time intelligence was received that the III. and IV. German Corps were concentrating at St. Vith and to the north of this place (about $9\frac{1}{2}$ miles south of Malmedy). Thus seven German Army Corps, comprising 300,000 men, were at this time massed on the routes leading into Belgium which converged on to the fortress of Liège.

The Germans bridged the Meuse at Lixhe on the 5th August and pushed cavalry patrols to Tongres, and on the same day a German cavalry regiment engaged a squadron of the 2nd (Belgian) Lancers at Plainevaux, south of Liège ; the latter charged the Germans and doing so lost 75 per cent. of its men.

On the same morning, a parlementaire arrived in Liège and demanded from the military governor of the fortress an unopposed passage for the German Army. His request being peremptorily refused, the Germans delivered a vigorous attack on the detached forts on the east and north-east of Liège ; although heavy artillery was brought against these works, the German attack was everywhere repulsed with heavy loss to the assailants. The most serious effort made by the Germans was that in the region north-east of Liège, between Fort Barchon and the Meuse ; the enemy forced the Belgian lines in this locality, but an energetic counter-attack delivered by the 11th (Belgian) Brigade broke up the Germans who retired in disorder. Thus the attack on the sector between the Vesdre and the Meuse (north of the former river) failed.

A vigorous attempt was made on the night of 5th—6th August to break the Belgian line between the Meuse and the Ourthe, south of Liège, with fresh troops. On the same night, a party consisting of two German officers and eight troopers penetrated into Liège and attempted to seize the Military Governor ; they failed to do so, being all killed. The assaults of the X. German Corps against the sector between the Meuse and the Ourthe compelled the Belgian troops defending the intervals between the forts in this region to retire. Portions of the 9th, 12th and 15th (Belgian) Brigades (belonging to the 4th Division) were sent forward from Huy and checked the Germans by their counterstrokes.

The Belgian troops belonging to the 3rd Division had been engaged since the 4th August on a very extended front ; they however repulsed

the furious attacks of an enemy possessing a fourfold greater strength at this point, they thus escaped the fate of being entirely surrounded. It was now necessary for these advanced Belgian troops to unite with the main army, the concentration of which had just been completed. All the Liège forts were still held by their permanent garrisons, but the Military Governor had come to the conclusion that they were no longer able to play the rôle of *forts d'arrêt*; he withdrew, with his staff, from the town of Liège and established his headquarters in the Fort de Loncin, on the west of Liège, towards midday on the 6th August.

The mobile Belgian troops, engaged in the defence of Liège, were next collected between the forts of Loncin and Hollogne, and marched westward; the 3rd (Belgian) Division reached the Gette on the evening of 6th August and continued its march to the Gette where it made junction with the main Belgian Army. This march was made without molestation from the German troops, only small parties of Uhlans being encountered. During the days immediately succeeding the departure of the 3rd (Belgian) Division the Liège forts continued to fire on German troops passing within range of their guns. Towards midday of the 12th August the Germans opened fire on the forts on the right bank of the Meuse with their heavy artillery of large calibre, and by the 17th *idem* the last of the Liège forts fell into their hands.

The Combined Operations of the Belgian Army in Conjunction with the Armies of the Allies during the Period 6th—20th August.—The third chapter records the events which took place immediately after the Belgian Army joined up with the British and French forces. By the 6th August, the concentration of the Belgian Army had been completed in the quadrilateral Tirlemont-Louvain-Wavre-Perwez, two marches distant from Liège. At this time, the 3rd (Belgian) Division was retreating towards this quadrilateral from Liège. The enemy had crossed the Meuse to the north of Visé; he had attacked Liège with three Army Corps, and other German Army Corps had been collected to the east and south-east of the last-named town.

The first defensive line on the western frontier of Belgium which the Belgian Army might have attempted to hold extended along the Meuse from Givet to Namur, prolonged thence northward along the Gette; the left of this position rested on the Demer. The general direction of this position was very suitable for barring an offensive movement from the east into Belgium, given sufficient troops to hold the whole extent of the line. However, the Belgian Field Army was not by itself strong enough in numbers to hold the whole position; it was sufficient to occupy the portion of the line along the Gette only, in order there to await the arrival of Allied troops required for the purpose of holding the portions of the line between the Belgian right and Namur and thence to Givet.

The Belgian Army whilst massed along the Gette was in a good position to cover Brussels and ran little risk of being cut off from Antwerp; the latter stronghold formed the base from which the Belgian Army drew its supplies of all kinds and in this city it was intended to establish the seat of government when Brussels had to be evacuated. The left of the position actually taken up rested on the river north-west of Tirlemont and the right on Jodoigne. The 1st and 5th (Belgian) Divisions held the first line, and in the second line were placed the 2nd (Belgian) Division at Louvain and the 6th (Belgian) Division at Hamme-Mille.

When the 3rd (Belgian) Division reached the Gette, it took up its position in the first line between the 1st and 5th Divisions. The (Belgian) Cavalry Division covered the front occupied by the three divisions referred to; it was at first located in the neighbourhood of Waremmé, thence it retired towards the left of the Gette position on St. Trond and finally fell back on to the Gette, extending the Belgian left to Diest. The 4th (Belgian) Division remained at Namur and formed a *point d'appui* to the Gette-Namur position.

At this time the permanent garrisons of the Liège forts were still holding out and the 8th Mixed (Belgian) Brigade which had been detached by the 4th Division to replace the 15th (Belgian) Brigade pushed into Liège, was in occupation of Huy.

German cavalry, supported by Jäger Battalions, appeared before the Belgian troops on the 10th August. Skirmishes were taking place between cavalry patrols almost daily about this time; the German cavalry next became active about Hasselt and Diest, and the Belgian Cavalry Division came into collision with this part of the enemy's forces at Budingen and Haelen.

On the 12th August the German cavalry attempted to force a passage across the Gette at Haelen: the enemy's troops consisted of six regiments of the 2nd and 4th Cavalry Divisions, the 7th and 9th Jäger Battalions and three batteries of artillery, comprising 4,000 sabres, 2,000 rifles and 18 guns. The Belgian Cavalry Division opposing this German force consisted of 2,400 troopers, 410 cyclists and 12 guns, and were therefore hopelessly outnumbered; however, an unequal combat was gallantly continued by the Belgians from 8.30 a.m. to 3 p.m.; at 10 a.m. the western limits of Haelen were rendered untenable owing to the fire of the German batteries, the Belgian cyclists therefore blew up the bridge over the river and retired on to the railway. By noon the enemy was already west of Haelen and delivered attacks simultaneously on the railway station at the place last named and also on the village of Zelch. The Belgian cyclists who had been hotly engaged for five hours were obliged to retire from the railway station and were charged by a squadron of German dragoons, but their fire was too intense for the German cavalry to make headway against, and the enemy

therefore deployed his reserves on the line Velpen-Liebroeck and supported the attacking troops by machine-gun and artillery fire. The Germans appeared to be about to carry everything before them, when at 3 p.m. the 4th Mixed (Belgian) Brigade (consisting of four battalions of the 4th and 24th Regiments) arrived on the scene; this brigade had made a magnificent march of $15\frac{1}{2}$ miles in $5\frac{1}{2}$ hours in the sweltering heat. Leaving Haekendover at 9.30 a.m. it arrived at Loxbergen in the nick of time. In spite of the fact that the men were tired after their long march they came rapidly into action and rushed the village of Velpen, where they came under the fire of German machine guns hidden in the houses. The Germans counter-attacked vigorously, supported by a heavy fire from their artillery, but at 3.30 p.m. the three batteries of the 4th Mixed (Belgian) Brigade were able to take up a position from which they silenced the German guns. At 6 p.m. the Germans ceased their attacks and retired on Haelen, leaving their dead and wounded on the field. The fight at Haelen was but an episode in the great onward move of the German forces.

According to the intelligence collected up to the 17th August the presence of numerous bodies of German troops had been reported in the area Wilderen-Lummen-Asch-Tongres, opposite the left of the Belgian Army on the Gette, and a continuous stream of the enemy's forces were also reported to have been moving westward across the military bridges thrown across the river at Lixhe; the arrival of a part of the enemy's main body, opposite the Belgian centre, that is, about Esemael, Landen, Waremme and Hannut, had been announced, whilst other parts of his main body were said to be on the Belgian front about Huppaye, Jauchelette, Pietrebais. German troops had also been reported to be crossing the Meuse at Ampsin and to have constructed bridges at Huy. The situation had become exceedingly critical by the morning of the 18th August.

On the date last mentioned, the Belgian Cavalry Division was attacked along the whole front, Budingen-Diest, occupied by it; it offered a strenuous resistance, especially at Diest. It was, however, not able to hold on to its positions and retired towards the Dyle, north of Louvain, whilst at the same time the 2nd (Belgian) Division was sent forward to prolong the left of the Belgian line on the Gette.

Further south the Germans attacked the 1st (Belgian) Division; pushing back the outpost troops, they occupied Tirlemont and delivered a frontal and also a flank attack on the Belgian position at Hautem St. Marguerite (about 2 miles north of Tirlemont). The 2nd (Belgian) Brigade held on obstinately to the positions allotted to it and sacrificed itself in the attempt; this sacrifice was not in vain, for it allowed the remainder of the division to withdraw in good order.

The intelligence collected by the General Staff of the Belgian Army left no doubt that the German forces were advancing on the front and flanks of the Belgian Army in numbers far superior to the latter. A considerable danger existed at this time of the Belgians being cut off from Antwerp by the German forces moving on Diest and Aerschot.

On the 18th August, the following German troops were on the left bank of the Meuse:—The II., IV. and IX. Corps which were advancing against the Belgian left on the line Diest-Tirlemont, the left flank of these corps was covered by the 2nd German Cavalry Division which was moving between the rivers Grande Nethe and Demer; the III., VII. and X. Corps, which had crossed the Meuse between Liège and Huy, were marching towards the front, Jodoigne-Namur, and were covered by the 4th and 9th German Cavalry Divisions advancing on Wavre and Gembloux. The foregoing six corps of the first line were being followed by five reserve corps.

Thus, independently of the German forces set in motion against France across the Belgian provinces of Luxemburg and Namur, some half a million of German troops were already operating on the left bank of the Meuse against the Belgian Army.

On the 18th August, the situation as regards the troops of the Allies was as follows:—The 5th French Army had one corps holding the bridges over the Meuse at Hastiere (about 15½ miles south of Namur) and the bridges over the Sambre between Tamines (about 13½ miles from Namur) and Floreffe (about 6 miles from Namur); the remaining three corps of this army were due to arrive in the neighbourhood of Philippeville (about 14 miles south of Charleroi) on the 19th August. This army was threatened by a German force, reported to consist of four corps, which had reached the line Yvoir (about 9 miles south of Namur)-Beauraing (about 25 miles south of Namur); it had delivered an attack on Dinant on the evening of the 17th August.

The British troops were at this time being derailed south of the Sambre in the neighbourhood of Maubeuge; the British cavalry had already completed its derailment, the remainder of the troops, it was expected, would probably be ready to advance into Belgium on the 22nd August, or the 23rd at latest.

In short, at this time the Belgian Army, comprising about two Army Corps, was in immediate contact with 11 corps belonging to the German I. and II. Armies; it was isolated and no combined operations in conjunction with French and British troops was possible.

A decision had to be taken without delay by the Belgian General Staff as to their next step. It was clear that if the Belgian Army remained in position on the line of the Gette it could not hope to do anything useful against the immensely superior German armies

which were on its front and threatening both its flanks; defeated in this position the remains of the Belgian Army would have been cut off from its supplies of food and ammunition at Antwerp. It had occupied its waiting position for 13 days, from the 5th—18th August, and during this time it had held at bay the German cavalry and advanced troops and caused them to lose time which was very precious. In view of the situation, at midday on the 18th August, King Albert decided to issue orders for his army to retire in a north-westerly direction, and at 7.30 p.m. these orders were in the hands of the commanders of the several units; these commanders were directed to retire at dusk, so as to be in position by daybreak next morning on the left bank of the Dyle, on the line Neerijssche-Louvain-Rotselaar (a front of about 10 miles). Whilst this movement was in progress the II. German Corps was being rapidly pushed forward to outflank the Belgian left and at dawn on the 19th August it came into collision with a brigade of the 3rd (Belgian) Division retiring on Aerschot which fought a rear-guard action. The German enveloping movement had progressed so rapidly that it was soon clear that the Belgian Army would not be able to occupy the position ordered on the previous evening. In consequence, a hurried retirement on to the forts of Antwerp took place and on the 20th August the Belgian Army gained the shelter of this fortress without having become seriously compromised in its retreat. It was now in a position to play a new rôle in co-operation with the Allied troops, that of holding a German force, at least equal to its own strength, in the neighbourhood of Antwerp.

The Germans pursued the Belgian Army; they arrived at Louvain on the 19th August, Brussels on the 20th *idem*, and it was thus not till the 24th August (on the 23rd day of mobilization) that they crossed the northern frontier of France, this great delay being entirely due to the tenacity with which the Belgian Army held on to its positions and the many sacrifices made by the Belgian soldiers in the cause of their Allies.

The Defence of the Fortified Position of Namur.—The fourth chapter of the Report is devoted to the operations which took place between the 5th—25th August round Namur. Namur was defended by nine detached forts, and as already explained the mobile defence of this region was entrusted to the 4th (Belgian) Division. German cavalry patrols had been in collision with Belgian cavalry patrols in the Condroz district (south-east of Namur) since the 5th August and in the Hesbaye district (north-west of Namur) since the 7th *idem*. On the 15th *idem*, German troops attempted to force the passage across the Meuse at Dinant, but were driven off by a French force holding the valley here. On the date last mentioned, the 8th (Belgian) Brigade, which had been holding Huy, finding that it ran the risk of being surrounded by the Germans, destroyed the bridges

over the river in that neighbourhood and retired towards Namur. On the 19th August, this brigade destroyed the bridges and obstructed the railway tunnel at Seilles and fell back from Andenne (on right bank of Meuse, about 10 miles eastward of Namur) on to the fortress of Namur.

On the date last mentioned, intelligence was received of the presence of large forces of German infantry and artillery about Faulx (about $5\frac{1}{2}$ miles south-east of Namur) and about Ramillies-Offus (about 11 miles north of Namur); the German troops were accompanied by guns of very large calibre. On the 20th August, the Germans began to push back the Belgian advanced troops in the north-east sector of the Namur defences; at the same time, it was discovered that they had established siege batteries against the south-east sector of the Belgian defences, and the Belgian artillery opened fire against these siege batteries. During the night of 20th—21st August, German infantry made three attempts to penetrate between the intervals on either side of Fort de Marchovette (the first of the detached works north of the Meuse) N.E. of Namur.

The bombardment of the four forts and works in the intervals on the north-east and south-east sectors of the Namur defences was commenced at 10 a.m. on the 21st August, from the commencement it was extremely violent, and for four hours the town itself was subjected to a rain of shell. By the evening, two of the forts had been seriously damaged and the telephonic communications with three of them were completely interrupted. This bombardment was kept up during the night.

On the morning of the 22nd August, the Namur garrison pushed out troops towards the German lines; these were met by well-directed rifle and machine-gun fire. The German bombardment against the Namur forts was as intense on this date as on the previous day. At 10 a.m. three French battalions (two of the 45th and one of the 148th Regiment) arrived on the scene; advantage was taken of their arrival to attempt an attack on the enemy's artillery reported to be in position on the left bank of the river about 4,500 yards from the north-east outskirts of Namur. Shortly after this attack commenced the Belgian field artillery taking part in the operation had to cease firing and the other troops engaged were therefore withdrawn. In the meanwhile the town of Namur had been subjected to a renewed bombardment; three of the forts in the north-east and south-east sectors still remained in action, but the fort on the right bank of the river, almost due east of Namur, had been so completely destroyed that it had to be evacuated, whilst the next fort to it on the left bank of the river, which had been the target for a systematic bombardment, had had the last of its cupolas knocked out. There was no interruption in the bombardment during the night of 22nd—23rd August and at daybreak next morning the fire of the large calibre

German artillery was turned on to the northernmost of the Namur forts; later an infantry assault on this fort was repulsed, but towards midday the Germans seized the fort. The German artillery was now turned against the two forts on the north-west sector of defence. The forts and the defence works in the intervals were one by one reduced to silence; on the north-east and south-east only was the Belgian field artillery able to reply to the enemy's fire and soon they also had to cease their activities and the Belgian troops in these sectors then retired into Namur.

The position of the 4th (Belgian) Division became, at this time, precarious. As the enemy was now on the left bank of the Meuse in considerable numbers and had forced the passages of the Sambre between Charleroi and Namur and those of the Meuse about Dinant the only lines of retreat left to the 4th (Belgian) Division lay in the region between the Sambre and the Meuse. Consequently, the commander of the 4th (Belgian) Division decided to withdraw his troops from Namur and retired south along the left bank of the Meuse, bivouacking at midnight of the 23rd—24th August between Arbre and Bioul (about $7\frac{1}{2}$ miles south of Namur). The Germans threatened this Division in rear and on the flanks, but it succeeded in extricating itself with the loss of its rear guard which was surrounded at Ermeton-sur-Biert (about $13\frac{1}{2}$ miles southward of Namur). Some 12,000 men succeeded in gaining Marienburg (about 30 miles south-west of Namur) and France (frontier about 12 miles from Marienburg). Ten days later this Belgian force entered Antwerp, and in spite of the difficulties of the retreat it arrived at the entrenched camp in good order and without having suffered any considerable loss.

The last of the Namur forts to surrender was the most westerly one known as Fort Suarlée; it did so, on the 25th August, after having been subjected to a most intense bombardment.

Operations in Co-operation with the Armies of the Allies during the Period 20th August—27th September.—In the fifth chapter a short account is given of the operations carried out by the Belgian, French and British Armies between the 20th August and the 27th September. On the 20th August, the Belgian Army had taken up a position on the Rupel and the Nethe, resting on the line of forts defending Antwerp; it had a detachment at Termonde. The Belgian Army had now to subordinate its operations to meet the requirements of the French and British forces. The principal part which it was called on to play was to hold as large a part as possible of the German forces in the neighbourhood of Antwerp; to do so effectively it was necessary for the Belgians to act offensively with vigour against the Germans whenever an important engagement took place between the Franco-British Armies and the German forces, and also in the event of the Germans at any time locating their troops in the immediate neighbourhood of the Antwerp defences to such an

extent as to give the Belgians the opportunity to strike with a considerable chance of gaining a success.

Up to the 25th September the German forces in the neighbourhood of Antwerp remained about equal in numbers to the Belgians holding the positions south of that city, but on the date last mentioned the Germans in this region received such considerable reinforcements as profoundly to modify the situation.

In the operations which were now in progress on a very wide front, the Belgian Army had to bear in mind that for purposes of combined action with the Franco-British forces a line of retreat to the westward must be kept open, at all costs, whereby a junction could ultimately be effected between the Belgian forces in Antwerp and the Allied Armies operating further south; and as a subsidiary task the Belgian troops had to be prepared to undertake enterprises against the German lines of communication, as and when an opportunity offered for carrying such an operation through successfully.

The following operations were undertaken by the Belgian Army, based on Antwerp, in order to fulfill its mission on the lines indicated above:—

On the 21st August, the main body of the German forces which had pursued the Belgians to Antwerp moved south on to the Sambre and Hainaut. In its place, a German *armée d'observation* was left in front of the Antwerp defences; this army consisted of the III. and IX. Reserve Corps. At the same time, the 13th Reserve Division and one or two Landwehr battalions were posted in the neighbourhood of Liège. These Reserve Corps had just arrived before Antwerp, on the 24th August, when the Belgian General Staff learnt of the severe fighting in progress on the Sambre and at Mons. The circumstances appeared favourable for a sortie on the part of the Belgian troops in Antwerp, and an operation of this nature was carried out on the 25th and 26th August with the object of breaking through the position held by the III. and IX. German Corps in order to threaten their lines of communication. The Germans were driven from some of the villages south of Malines held by them, but when it became known at the Belgian headquarters that the fighting on the Sambre and at Mons had ceased it was concluded that nothing would be gained by prolonging the operations in this region and the Belgian Army was withdrawn once more, to the shelter of the Antwerp defences.

On the 4th September, a German force marched on Termonde and, having driven the Belgian detachment holding this town out of their positions, it crossed the Scheldt. The Belgian communications with Ostend were now threatened and the 1st and 6th (Belgian) Divisions were, therefore, moved across to the left bank of the Scheldt. The enemy at this time recrossed to the right bank of the river, and Termonde was once more in Belgian hands. From this

date, the efforts of the enemy to pass to the west of the river were checked and the Belgian line of retreat to the west thus secured.

On the 7th and 8th September, intelligence reports indicated that the Germans had withdrawn a part of their forces watching Antwerp. As a matter of fact, three divisions of the *armée d'observation* had been moved south to reinforce the German troops retreating from the Marne to the Aisne and were replaced by a division of German Marines and by the 26th and 37th Landwehr Brigades.

A sortie was decided upon by the Belgian General Staff with the object of turning the German right. Five Belgian divisions and the Belgian Cavalry Division took part in these operations ; these troops were set in motion on the 9th September and brought the operations to a successful issue. On the date last mentioned, the Belgians wrested the passages over the Demer and Dyle out of German hands and seized Aerschot. On the day following, the Belgian offensive was continued towards Louvain and a troop of Belgian *Chasseurs à cheval* entered the town ; on the other hand, the 2nd (Belgian) Division was checked about $2\frac{1}{2}$ miles north of Louvain. In order to hold the Belgians, the 6th German Reserve Division was hastened back from France to Antwerp.

On the 11th September, the 3rd (Belgian) Division drove back the Germans at Over de Vaart (midway between Malines and Louvain) ; and the 6th (Belgian) Division seized the railway in the same neighbourhood.

On the 12th September, the 6th German Reserve Division, having reached a point some 4 miles north-west of Louvain, in its turn assumed the offensive and drove the 2nd (Belgian) Division eastwards towards Aerschot ; this move necessitated the retreat of the 6th and then the 3rd (Belgian) Divisions.

On the 13th September, the entire Belgian Army was once more back within the defences of the entrenched camp of Antwerp, having successfully accomplished its purpose. These operations not only caused the 6th German Reserve Division (III. Reserve Corps) to be recalled to Antwerp, but as was learnt later, the offensive of the Belgians brought about a delay of two days in the southward march of the IX. German Reserve Corps, just at the time that the German armies had commenced their retreat from the Marne and these reinforcements were urgently needed. This sortie further caused grave misapprehensions in the enemy's camp at Brussels.

The Germans now began to take the necessary steps to lay siege to Antwerp and brought up powerful guns and a large mixed force for the purpose.

On the 13th September an equality between the forces of the besieged in Antwerp and of the besiegers was again established : the Germans continued to strengthen their positions south of Antwerp.

During the next few days seven detachments, each consisting of 100 volunteer cyclists, were organized in Antwerp for the purpose of interrupting the railways in Belgium. A definite zone was allotted to each of these detachments which set out from Antwerp on the 22nd September; they succeeded in interrupting the principal railways in the provinces of Limburg, Brabant and Hainaut and thereby caused the Germans considerable inconvenience. The greater part of these detachments returned to Antwerp on completing the tasks allotted to them, a few only of those taking part in the enterprise were captured or killed.

On the 25th September, the French General Staff suggested to the Belgian General Staff that, as violent attacks were in progress on the Franco-British left, the moment was opportune for further enterprises against the German lines of communication.

Whilst the preliminary measures were in hand in connection with an attack by the Belgian troops on the German communications, it was definitely established that the German troops in the neighbourhood of Antwerp had been considerably increased, and that the measures in relation to a regular siege of the entrenched camp were in an advanced stage of preparation. In consequence, the idea of executing any further enterprises on a considerable scale against the German communications had to be abandoned. However, the 37th Landwehr Brigade, having been left in an isolated position in the neighbourhood of Termonde, orders were given to the 4th and 5th (Belgian) Divisions and the Cavalry Division to attack this brigade: the results hoped for were not attained as the 5th (Belgian) Division found its own left flank to be threatened and therefore could not carry out its orders.

The Defence of the Entrenched Camp of Antwerp.—The sixth chapter of the Report gives an account of the attempt of the Belgian Army to hold on to their great arsenal and base of supplies. The German Army detailed for the Siege of Antwerp consisted of the III. German Reserve Corps, the 26th and 37th Landwehr Brigades, one division of Marines, the 4th Ersatz Division, the 1st Reserve Ersatz Division, one Bavarian Division (probably), one artillery brigade, and one brigade of siege pioneers.

The siege operations against Antwerp commenced on the 28th September; at this time the bulk of the Belgian Army was in the 4th Sector of Defence (roughly from the junction of the Rupel with the Scheldt eastward to junction of the Dyle with the Rupel). The 2nd, 3rd and 6th (Belgian) Divisions had each left a battalion of infantry, a cavalry regiment, a company of cyclists and a brigade of field artillery in the 3rd Sector of Defence (roughly from the junction of the Dyle with the Rupel northward to the junction of the Grande Nethe with the Petite Nethe at Lierre) in order that this sector should be made secure. The 2nd (Belgian) Division was held

as a general reserve to the troops holding the 3rd and 4th Sectors of Defence. The enemy drove back the detachment of the 1st (Belgian) Division which had been holding the southern limits of Malines early in the day and bombarded the forts of Waelhem and Wavre Ste. Catherine, situated in the angle formed by the Dyle and the Nethe, with guns of large calibre. The fire from the 16.5-in. howitzers soon made itself felt against the latter of these two forts. The General Staff in Antwerp moved the 1st and 2nd (Belgian) Divisions in haste into the 3rd Sector of Defence, retaining at the same time the 3rd and 6th (Belgian) Divisions in the 4th Sector; the 4th (Belgian) Division was at Termonde, whilst the 5th (Belgian) Division formed a General Reserve.

The Germans attacked the 4th Sector on the 29th September and drove back the advanced posts of the 3rd and 6th (Belgian) Divisions. On the same day, the intensity of the bombardment directed against the 3rd Sector caused the Belgian advanced posts on this front to retire also to the line of the forts. The works between the Petite Nethe and the Grande Nethe next came under the fire of the siege guns. The forts of Waelhem and Wavre Ste. Catherine had a particularly trying time on the date last mentioned; a magazine in the latter was blown up and at 6 p.m. both of them had suffered so much damage to their masonry work that the garrisons were obliged to evacuate them.

The effects which could be produced by the German heavy artillery had already been disclosed by the nature of the destruction wrought earlier at Liège, Namur, and Maubeuge and, on this 29th September, the damage done to the forts of Waelhem and Wavre Ste. Catherine left little doubt in the minds of the responsible authorities as to the fate which was in store for the fortifications of Antwerp. It was clear that the great Belgian entrenched camp could no longer be considered a secure refuge for the Belgian Field Army.

The Belgian General Staff now felt that the question of abandoning Antwerp, before it was too late to withdraw the field army, would have to be faced. The first thing to be done was to select a new base; the choice fell on Ostend and to this place were immediately transported the wounded, the German prisoners, supplies of all kinds, the dépôts, recruits belonging to new levies, volunteers under training, the administrations of the factories, etc., etc. The base having been removed from Antwerp, the army regained its liberty of action, it could now continue as a living force either within Antwerp or without it, and it was in a position to quit the place as soon as the Germans began to close in round the entrenched camp.

The only available line of railway from Antwerp to Ostend was that on the left bank of the Scheldt, *via* St. Nicholas and Ghent; Antwerp itself lies on the right bank of the river and there is no

railway connection within the city between the two banks of the river. The first railway bridge across the river is that at Tamise, just outside the outer line of forts south-west of the city, and to reach this bridge it was necessary to pass over the bridge of Willebroeck which was itself under the enemy's artillery fire. However, the arrangements which had been made worked so excellently that trains travelled throughout every night between the 29th September and 7th October with their fire-boxes so well screened that the enemy's attention was not attracted and the trains were in consequence unmolested.

The preparations for the withdrawal of the army were next completed ; but it was still necessary to provide for the protection of the lines of retreat. Further, the situation dictated that the Belgian Army should hold on to Antwerp as long as possible, in order to give the French and British troops every chance of coming north so as to prolong the Belgian line southwards along the line of the Dendre, at its junction with the Scheldt at Termonde.

The situation here was similar, to all intents, with that which existed earlier in the War when the Belgian Army took up a position on the line of the Gette.

The Belgian Army now took up positions as follows :—Five divisions (the 1st, 2nd, 3rd, 5th and 6th) occupied a line in front of the Rupel and the Nethe in defence of the forts threatened ; the 4th Division held Baesrode, Termonde and Schoonaerde on the Scheldt and covered the line of retreat to the coast ; the Cavalry Division was based on Wetteren and had the left bank of the Dendre under observation, it therefore effected a purpose similar to that undertaken by the 4th (Belgian) Division. So long as the enemy had not crossed to the west of the Dendre, no serious risk was being run of the Belgian line of retreat being cut.

Between the 30th September and 6th October, the Germans continued their attack on the detached forts of Antwerp and the intervals between them ; by degrees the fire of the heavy guns began to play havoc with the masonry of the forts, cupolas were knocked out of their pits, the concrete was fissured and in some cases the enemy penetrated into the forts and completed the work of destruction by mining.

On the evening of the 3rd October, when many of the forts had already been rendered untenable, one of the newly-raised British Marine Brigades consisting of 2,200 men marched into Antwerp, and on the 4th *idem* it relieved the 1st Mixed (Belgian) Brigade holding the position in front of Lierre (about $9\frac{1}{2}$ miles south-east of Antwerp). On the date last mentioned, the Germans commenced to bombard the defences to the north of the Nethe and drove back the Belgian troops which had been holding the defences in the fork of the Grande Nethe and the Petite Nethe ; at the same

time they crossed to the left bank of the Dendre and attempted to force the Scheldt at Termonde and Schoonaerde.

On the 5th October, the Germans occupied Lierre but were unable to advance beyond this town; they succeeded however in crossing the river below Lierre. New attacks were now launched by the Germans against the troops holding the line of retreat, notably those at Schoonaerde; they were repulsed everywhere, but the position of the 4th (Belgian) Division had commenced to become critical.

On the 6th October, the besiegers made a determined general attack on the position to the north of the Nethe. The 1st, 2nd and 5th (Belgian) Divisions, which had been reinforced by the 3rd and 6th (Belgian) Divisions and the British Marine Brigade could no longer hold on to their positions in view of the violence of the German artillery attack and yielded ground. Several counter-attacks were delivered by the besieged, who in some cases gained the banks of the Nethe, but the German advance could not be checked.

On the date last mentioned, the Germans made further efforts to force the passages of the Scheldt at Baesrode, Termonde and Schoonaerde but the 4th (Belgian) Division and the (Belgian) Cavalry Division succeeded in holding up the enemy. In response to the call for assistance from the commander of the 4th (Belgian) Division, the 6th (Belgian) Division received orders at 10 a.m. to cross the Scheldt at Tamise for the purpose of supporting the 4th Division.

The enemy having at this time crossed the Nethe and the Dendre, the position of the Belgian Army had indeed become critical.

Operations in Co-operation with the Armies of the Allies during the Period 6th-15th October.—The seventh chapter of the Report deals with the fall of Antwerp and the operations immediately subsequent thereto. Up to the beginning of October the main consideration before the Belgian General Staff was how to avoid the danger of the Belgian Army being shut up for good in Antwerp by a complete and close investment of this entrenched camp by the German troops. A new danger now threatened the Belgian Field Army. The retreat of the German forces from the Marne had, on the 13th September, brought their right wing back to Lassigny.

From the date last mentioned, both the German and the Allied Armies in France commenced to manœuvre with the object of the one outflanking, if possible, the westernmost wing of the other. The German right wing had thus been pushed further and further northwards from Lassigny and, at the beginning of October, had reached the neighbourhood of Lille. The Belgian Army consequently found itself in the predicament that after all it might be entirely cut off from the Franco-British forces if the German right wing continued to extend northwards; the distance from Lille to the sea at Nieuport is approximately $37\frac{1}{2}$ miles, whilst that from the

Nethe to Nieuport is $87\frac{1}{2}$ miles, that is to say more than twice as great. Therefore, in the first days of October, the line of retreat from Antwerp was threatened not only by the German troops besieging that city, but also by the right wing of the German Armies operating in France.

If then it was desired to maintain intact the Belgian Field Army in Antwerp, it became imperative that its line of retreat to the west should be more effectively secured than was the case at the date in question. For this reason, it became necessary to occupy the railway junction at Ghent which was approximately at the same distance from Lille as it was from the position on the Nethe still held by the Belgian Army.

The Belgian General Staff, being convinced of the importance of Ghent and having no troops available to despatch to this centre, represented the urgency of the matter to the British Government, pointing out that the securing of Ghent would enable the defence of Antwerp to be prolonged. The British Government promised to send the 7th (British) Division to Belgium at once; and it was arranged that French troops would also co-operate to secure the Belgian line of retreat on Ostend.

The situation on the evening of 6th October was as follows:—The Germans had pierced the Belgian line on the Nethe; they had crossed the Dendre and the Scheldt and were attacking with considerable energy the Belgian troops holding positions on these rivers; the German forces in the Antwerp region were steadily increasing and it was clearly out of the question for the Franco-British forces to make a junction in Antwerp with the Belgian Army holding the defences in the entrenched camp; the occupation of Ghent by the Allies had been assured; the last of the military supply trains for Ostend had left Antwerp between 6 and 7 p.m. on this date.

It was still possible for the Belgian Army to withdraw from Antwerp, but there was no time to lose; it was therefore necessary to set the troops in motion on their westward march without further delay.

King Albert ordered his field army to cross to the left bank of the Scheldt between the hours of 6 and 7 p.m. by the bridges at Tamise Hoboken (about 3 miles south of Antwerp) and Burght (about $1\frac{3}{4}$ miles south of Antwerp), and to march westward. The garrison troops of Antwerp were to continue to defend the detached forts and other works, with the assistance of a few regiments of (fortress) infantry, the 2nd (Belgian) Division, three brigades of British Marines; two of the latter had arrived in Antwerp the day before (5th October).

The retreat commenced on the evening of the 6th October and at 7 a.m. next morning the whole of the Belgian Army had arrived safely on the left bank of the Scheldt. King

Albert left Antwerp between 7 a.m. and 3 p.m. on the 6th October. The retreat had not been commenced any too soon, for on the 6th October, the Germans forced a passage across the Scheldt at Schoonaerde. The 6th (Belgian) Division contained the enemy at Berlaere; the presence of German forces south of Ghent was also reported, but as the Franco-British troops expected at the last-named place had not arrived there yet, the 4th (Belgian) Brigade was rapidly pushed forward to Ghent to check the Germans in that neighbourhood.

On the 8th October the enemy came into collision with the 3rd (Belgian) Division in the neighbourhood of Lokeren, about 7 miles north-west of Termonde; the same evening, the 1st (Belgian) Division was conveyed by rail from St. Nicholas to Ostend, whilst the remaining divisions marched on towards the Terneuzen Canal (running northwards from Ghent).

On the 9th October, the 37th Landwehr Brigade and the 4th Ersatz Division reached the neighbourhood of Lokeren; at the same time, the 1st Ersatz Division and a Bavarian Landwehr Division advanced towards Ghent; however, a French Brigade of Fusilier Marines had already occupied the last-named place and, on this day, a considerable part of the 7th (British) Division also arrived in Belgium. Ghent and its approaches on the east and south-east were, in consequence, now occupied by from 25,000 to 30,000 men.

The German troops which had crossed the Scheldt, finding their left flank threatened, were not able to interrupt the retreat of the Belgian Army which continued its march westward without being seriously disturbed.

During the period of the Belgian retreat, the Germans redoubled their efforts against the defences of Antwerp. In view of the general situation the Military Governor of Antwerp decided at 5 p.m. on the 8th October that the 2nd (Belgian) Division and the British troops, except the Anglo-Belgian garrison of Fort 4 (of Inner Line South-East Defences) should follow the main Belgian Army and make an attempt to join up with it; these troops crossed the Scheldt the same evening by the bridges at Burcht and Steen and, by 2 a.m. on the following morning, the whole of these troops were safely on the left bank of the river.

The Germans continued the bombardment of the city till about midday on the 9th October; previously to this the garrison of Fort 4 had evacuated this work and had crossed the Scheldt, destroying the bridges over the river as soon as they were safely across. Towards evening on the date last mentioned, the Germans entered Antwerp and, on the day following (10th October), the Military Governor capitulated.

On the morning of the 9th October, the main body of the Belgian

Army was to the west of the Ghent-Terneuzen Canal, with rear guards to the east of this canal at Loochristy, Lokeren, Wachtebeke and Moerbeke, which had been left behind to cover the retreat of the 2nd (Belgian) Brigade and the British Marine Brigades which had left Antwerp on the 8th October.

The Belgian Army in falling back could make a stand on two defensive positions situated on its line of retreat ; one of these being the Ghent-Terneuzen Canal prolonged by the Scheldt, and the other the Schipdonck Canal prolonged by the Lys. It had been hoped to make a stand on one at least of these positions, in order to secure the greater part of Flanders against invasion, should it be possible to join up with the Franco-British forces sent to the support of the Belgian Army.

But, at this time, the French left wing was at Arras, and the British Army had only just commenced its disembarkation from the trains which had conveyed it to the region of St. Omer. An attempt on the part of the Belgians to hold either of the two positions would, under the existing circumstances, have involved the serious risk of the right of the Belgian Army being turned by the large German force in Belgium and of its being forced back into Holland or driven helter-skelter on to the sea. The German troops were already on the march to the west and consisted, in addition to the troops which had been besieging Antwerp and several divisions of which were now available for employment elsewhere, of the new formations known as the XXII., XXIII., XXVI. and XXVII. Reserve Corps, which had just arrived in Belgium.

These considerations led to the decision being taken to continue the retreat to the Yser, there to join up with the Franco-British Armies. The Yser position possessed at that time considerable advantages. From the general point of view, it formed an extension of the Franco-British front, extending from Lassigny to Arras (a front of about 50 miles) ; it was an excellent position and one in which the Belgians could expect to hold out until the Franco-British forces joined up with them. The position was also good from the tactical point of view ; its left flank rested on the sea, its front was covered by the river Yser, whilst its right flank was also protected by the same river. Further, the length of the line was not too great for the number of troops available for its defence ; and the position offered the additional advantage, from the point of view of the *morale* of the Belgian troops, that it was situated wholly within their own country. Consequently, the Belgian Army took up its position on the line of the Yser.

On the 11th October, the Belgian troops left at Ghent, having accomplished the purpose for which they were originally sent there, were ordered to retire westward. The Germans again advanced to attack this place the same evening, but were checked by the 7th

(British) Division which, however, retired later, keeping the enemy at a distance with artillery and rifle fire.

The Belgian cavalry covered the retirement and remained in contact with the enemy, fighting actions on the Ghent-Terneuzen Canal, on the Scheldt, the Schipdonck Canal and on the Lys. The 1st (Belgian) Cavalry Division then fell back towards the right of the Belgian Army after a fight at Lootenhulle; the 2nd (Belgian) Cavalry Division, consisting largely of divisional cavalry, fell back on Ursel, Bruges and the front held by the Belgian Army.

The occupation of the Yser position by the Belgian Army was completed on the 15th October, many difficulties having been overcome during the course of the retirement from Antwerp.

The Operations of the Western Allies: The Battle of the Yser.—In the fighting which had taken place since the beginning of the War the losses of the Belgians had been very heavy, so that when the Belgian Army reached the Yser its total strength had been reduced to 82,000 men, of whom 48,000 were infantry.

By the 15th October, the French front had been strongly established as far north as La Bassée. Since the end of September the Germans had made a continuous effort to outflank the left wing of the Franco-British Army. The German forces which had been engaged in the principal theatre of operations were, towards the middle of October, joined by the troops liberated by the fall of Antwerp and by the four corps of the new formation already referred to. To meet the great turning movement of the Germans, between La Bassée and Dunkirk, there were immediately available the remains of the Belgian Army, the 7th British Infantry Division, the 3rd British Cavalry Division, the French Brigade of Fusilier Marines and two French Territorial Divisions. The Belgian Army, to which was attached the French Brigade of Fusilier Marines, took up the position along the Yser from the sea to Zuydschoote. The 7th British Infantry Division and the 3rd British Cavalry Division took up a position in front of Ypres.

The defensive arrangements on these positions were soon completed. At this time, a British cavalry corps and the 2nd and 3rd British Army Corps had been completely transported to St. Omer, whilst at the same time the two French Territorial Divisions were advancing on Ypres and bodies of French cavalry were moving on Staden and also operating in the direction of Lille. The situation on the 17th October was as follows:—The 1st British Army Corps was still in process of transportation to St. Omer, the British Cavalry Corps and the 2nd and 3rd British Army Corps were in occupation of positions extending from La Bassée to the right of the position held by the 7th British Infantry Division on the line Zandvoorde-Gheluvelt-Zonnebeke; to the north of the last-mentioned position

were British and French cavalry which maintained connection between the British and Belgian fronts.

Briefly then, the occupation by the Western Allies of a continuous front from the Argonne to the sea was an accomplished fact; although it was by no means sufficiently strongly held to prevent its being pierced by the very considerable German forces then ready to attack the Allied line. Measures were however being taken to strengthen the portion of the line north of the Lys, the 1st British Army Corps was expected to take up a position from Zonnebeke to Langemarck, on the 21st October, in extension of the left of the position occupied by the 7th British Division; the 42nd French Division was to join up on the Belgian front on the 23rd October; the 9th French Corps was to occupy a position east of Ypres on the 24th October, whilst the 16th French Corps was to take up a position south of Ypres on the 31st October. Time was still the essential consideration. The enemy's plans were soon disclosed—he intended to seize the line of the Yser from the sea to Dixmude and to break through the Belgian portion of the front with the object of turning the Franco-British left. The French General Staff requested the Belgians to hold on to their positions for 48 hours.

The position taken up by the Belgians from Nieuport-Bains to Boesinghe was $22\frac{1}{2}$ miles; Dixmude was centrally situated on this line. The Yser, which lay in front of this position, has a width of about 22 yards, and is provided with embankments on both banks; the embankment on the west bank having a command of some 6 ft. over that on the east bank. The river makes a loop, known as the "Tervaete Loop," about half-way between Nieuport and Dixmude, the salient of which projects eastward and thus formed a weak point in the Belgian defence line. The whole region is much intersected by canals, ditches and rivers; eight bridges spanned the portion of the river under consideration. Another feature of importance in this region was the railway from Nieuport to Dixmude; it is constructed on an embankment having a command of from 3 to 6 ft. over the surrounding plain. Six canals and water courses flow into the sea at Nieuport, they are provided with sluices by means of which the region of the Yser can be flooded at high water.

The 2nd (Belgian) Division held the left of the line resting on the sea, and the remaining troops were extended from their right in the following order:—1st (Belgian) Division, 4th (Belgian) Division, the French Fusilier Marines, the 11th and 12th (Belgian) Regiments of the Line, two brigades of field artillery belonging to 3rd (Belgian) Division, the 5th (Belgian) Division, and the 6th (Belgian) Division.

The French troops and the artillery mentioned above held a bridgehead at Dixmude covering the railways to Nieuport and Furnes. The 6th (Belgian) Division had French Territorials on their right south of Boesinghe.

The 3rd (Belgian) Division had two brigades in reserve at Lampernisse. The 1st (Belgian) Cavalry Division covered the Belgian right flank and acted in co-operation with French cavalry in the direction of Roulers; the 2nd (Belgian) Cavalry Division was in reserve between Nieuport and Furnes. The only troops in reserve, behind the front of $22\frac{1}{2}$ miles referred to above, were the two infantry brigades and the cavalry division above mentioned.

The Germans reached the Yser position on the 16th October and made a reconnaissance in force towards Dixmude the same day. On the following day, the presence of considerable bodies of German troops was reported towards the north of the Belgian position, indicating that the enemy intended marching against the front Nieuport-Dixmude; later in the day German artillery came into action at Slype and bombarded Rattevalle. It was decided to reinforce the portion of the Belgian front most immediately threatened, in consequence the 5th (Belgian) Division was withdrawn from the right of the Belgian line and located at Lampernisse and the 3rd (Belgian) Division was moved to Avecapelle. The gap in the line created by the withdrawal of the 5th (Belgian) Division was filled by a brigade from the 6th (Belgian) Division, moved into the line from Noordschoote.

The German attack on the Belgian advanced posts commenced on the 18th October; the Germans obtained a passing success at Mannekensvere opposite Nieuport. The British Navy came to the assistance of the Belgians and bombarded the German troops on the coast between Nieuport and Middelkerke; this support and that given by the French troops on the Belgian left was much appreciated.

It was felt that the Franco-British Cavalry Force operating in the direction of Roulers sufficiently protected the right of the Belgian line, and in consequence the 6th (Belgian) Division was moved to Lampernisse as a reserve, the 5th (Belgian) Division now taking post at Oostkerke and the 3rd (Belgian) Division at Wulpen for a similar purpose. French Territorials took up the positions vacated by the 6th (Belgian) Division, and the 1st (Belgian) Cavalry Division joined up with the French cavalry and were ordered to maintain close touch with the right of the Belgian troops.

On the 19th October, the Germans attacked the Belgian left and centre and captured the advanced positions from Lombaertzijde (about 1 mile north of Nieuport) to Beerst (about 2 miles north-north-east of Dixmude), a front of about $8\frac{1}{2}$ miles.

The 6th (Belgian) Division received orders to entrench itself at Pervyse (on the railway about midway between Nieuport and Dixmude), and, at the same time, to ease the position on the Belgian left and centre a counter-offensive against the German left was decided upon. The 5th (Belgian) Division was ordered against

Vladsloo (about 2 miles north-east of Dixmude) ; the French Fusilier Marines were sent against Beerst whilst the 11th and 12th (Belgian) Regiments of the Line were to hold the bridgehead at Dixmude.

This counter-offensive had been launched and Beerst and Vladsloo had already been occupied by the Allies, when reports were received to the effect that strong bodies of German troops of all arms had pushed through north and south of Roulers and that the Franco-British cavalry was retiring from Roulers. In consequence, the position of the French Fusilier Marines and the 5th (Belgian) Division, on the right bank of the Yser, appeared too exposed and these troops were recalled to the left bank of the river.

On the 20th October, an intense bombardment took place of the whole Belgian front and a double attack was also delivered by the Germans against both the flanks of the Belgian position. The Belgians in consequence were compelled to yield more ground, particularly on their left, but in the neighbourhood of Dixmude they repulsed the German attack.

By the 21st October, the Germans had completed their concentration ; the 4th Ersatz Division was opposite Nieuport, the III. Reserve Corps was on the front Nieuport to Keyem (about $3\frac{1}{2}$ miles north-north-east of Dixmude), the XXII. Reserve Corps was to the north of Dixmude, the XXIII. Reserve Corps opposite Dixmude and to the south of this place ; the German forces totalled thus seven divisions. The Belgian and French General Staffs now agreed that the Belgian Army should be concentrated on a narrower front than that occupied by it, and the position from Nieuport to St. Jacques-Capelle (about 2 miles south-west of Dixmude) that is to say, a front of $12\frac{1}{2}$ miles was assigned to it, the remainder of the position southwards being taken over by French troops.

During the night of 20th—21st October and also during the whole of the 21st October a violent artillery fire was directed against the Belgian position and did much damage. There was scarcely any fighting on the part of the infantry.

By the evening of the 21st October, the position of the Belgian Army had become critical ; the greater part of the reserves had already been used up.

During the night of 21st—22nd October, matters took a serious turn ; taking advantage of the darkness of the night the Germans had seized a temporary bridge at Tervaete and crossed over to the left bank of the river. The Belgians tried to drive them back and several counter-attacks were launched for the purpose, but without success. The Belgian casualties were heavy, and the troops holding this part of the line had to fall back ; in consequence, the enemy was able firmly to establish himself in the positions gained. However, the Belgian artillery poured a continuous rain of shell on the Tervaete Loop in order to render the German position untenable and

so as to prevent the construction of bridges across the river. At other points along the river the German attempts to cross had been defeated and in front of Nieupoort the Belgians even gained some ground.

On the 23rd October, the 42nd (French) Division arrived on the scene and was pushed to Nieupoort for a counter-attack on the German right. The position of the Belgian centre opposite the Tervaete Loop soon became exceedingly critical owing to the fact that German troops were being massed against it in very great strength. During the night 23rd—24th October, the Belgians again gave ground, but were ordered to hold on at all costs to the chord of the Tervaete Loop. However, their losses were so heavy that their commander in this region reported: "The troops are worn out, their *morale* is lowered and they consequently may be seized by panic at a trifling incident." The brigade commander at Dixmude also reported that his troops were tired out. The Belgian General Staff, recognizing that the situation at the Tervaete Loop was extremely serious, asked the French commandant in this region in express terms for support at the Belgian centre, stating: "An energetic counterstroke of as great a number possible of the troops of the 42nd Division (engaged near Nieupoort) may yet re-establish our position." The French commandant responded by sending one brigade of the 42nd (French) Division as requested; it came into action at daybreak on the morning of the 24th October. During this day, the German pressure on the Belgian line was so great that the Belgians had again to yield ground falling back to the line of the Beverdijk. A French counter-attack failed to drive back the enemy.

The Germans now made a supreme effort against Dixmude. During the night of 23rd—24th October, they delivered 15 distinct attacks, but were held at bay by the French and Belgian troops at this point. The German attacks were renewed during the day, and they captured the trenches at the bridge, only to be driven therefrom later. In one case a Belgian battalion was fighting continuously for 72 hours in its trenches, and in two other cases Belgian troops were engaged continuously for 43 hours.

In view of the situation referred to above, a further representation was made to the commander of the French troops at Nieupoort regarding the position of affairs at the Belgian centre and, in consequence, practically the whole of the 42nd (French) Division was moved from the left flank to support the Belgian centre.

On the 25th October, the German attack slackened which appeared to indicate that the German troops were worn out; however, they were able to check a counter-attack made against their left flank at Oud-Stuyvekenskerke by a French brigade and the 5th (Belgian) Division. On the evening of this day the Belgians were still in

possession of the position taken up on the Noord-Vaart and the Beverdyk; they also held Oud-Stuyvekenskerke, a part of the embankment on the Yser in the neighbourhood of the 15-kilometre milestone, also the bridgeheads at Nieuport and Dixmude. Advantage was taken of the relative calm to reorganize the Belgian troops and to sort them out into their proper units. During this day the Belgian General Staff went into the question of withdrawing the Belgian troops to the line of the Nieuport-Dixmude railway and of flooding the country to the eastward of this railway up to the Yser.

By the 26th October, the Belgian artillery had suffered considerable losses and it had but 100 rounds a-piece left for the guns still in action. The Belgian infantry was also so exhausted that, in some cases, the men were not able to hold out any longer against the German attacks and therefore retired before the German advance, temporarily surrendering possession of the railway at some points. The Belgian troops at Dixmude had a particularly trying time, fortunately two Senegalese battalions arrived most opportunely and saved the situation. In the evening, the two Belgian Cavalry Divisions were told off to guard the bridges over the canal between Furnes and Loo.

The enemy showed little real activity on the 27th and 28th October and advantage was taken of the lull to withdraw the remnants of the 3rd and 6th (Belgian) Divisions from the firing line and to form them into a sort of reserve. The preparations made for inundating the country eastward of the railway being complete, the sluices were opened on the 28th October and the country in front of the position held by the 2nd (Belgian) Division was flooded. On the day following, the Germans were again very active and subjected the position held by the 1st, 2nd and 4th (Belgian) Divisions to a violent artillery bombardment. On this day, the inundations began to extend southwards.

On the 30th October, the Germans pressed their attacks on the Belgian left and centre; they were repulsed at all points, except at Ramscappelle (about $1\frac{1}{2}$ miles south of Nieuport) where the enemy bombed the Belgians out of their trenches and thus succeeded in gaining a footing on the railway. However, during the afternoon and evening of this day, a counter-attack was delivered by Belgian and French troops who forced the Germans back from the railway and reoccupied the railway Halt at Ramscappelle.

The inundations now commenced to spread over the whole region prepared for this purpose and the Germans were no longer able to remain in occupation of the trenches between the railway and the Yser. Thus ended the Battle of the Yser.

Soon the Germans were in possession of a few strong points alone on the left bank of the river; they retired leaving behind them their wounded, rifles, guns and ammunition.

The Belgian losses were considerable, being estimated at 14,000 killed and wounded. The Belgian infantry was reduced to 32,000 rifles, and more than one-half the guns of the Belgian artillery were out of action.

The heroic resistance of the Belgian Army had resulted in breaking up the attack of seven German Divisions which suffered considerable losses and were put *hors de combat* for some time to come. The important thing however was that time had been gained and, in the meantime, the Franco-British defences to the south of the Yser had been strengthened, and particularly those near Ypres.

During the two succeeding months the operations on the Yser front resolved themselves into sporadic advances and retreats. At the end of 1914, the Germans had been practically driven from the left bank of the Yser ; they had only some listening and observation posts left in their hands on this bank of the river, the inundations having so completely effected their purpose.

General Review.—The ninth chapter concludes the Report with a general review of the operations. It is pointed out that during the night of the 3rd—4th August, that is a little more than 24 hours after the delivery of the German Note to the Belgian Foreign Minister, reliable information having been received that German troops were about to invade Belgium, the Belgian troops took up positions with the object of ensuring respect for the neutrality of the little kingdom ; one division was told off to observe the territory which might be threatened by a British invasion, two divisions the frontier likely to be threatened by France and a fourth division the frontier actually threatened by Germany.

The Belgian plans were drawn up with the main object of covering as large a tract as possible of Belgium against invasion and, in order to secure this object, it was intended that the Belgian Army should act in concert with the forces of those Powers who were ready to act in strict accordance with their treaty obligations in relation to the protection of the neutrality of Belgium. It was not till the Belgian Army had gained the line of the Yser was it able to act on a concerted plan of joint operations ; by this time, practically the whole of Belgium had already been invaded.

By taking up a succession of defensive positions, from that of the Gette in mid-August to that on the Yser in mid-October, the Belgian Field Army had managed to hold itself together in face of far superior German forces and from the time that the Yser was occupied, during the two and a-half months of fighting which ensued, the only losses which the Belgians suffered were the actual casualties taking place on the field of battle ; no organized unit fell into German hands as prisoners during the period referred to.

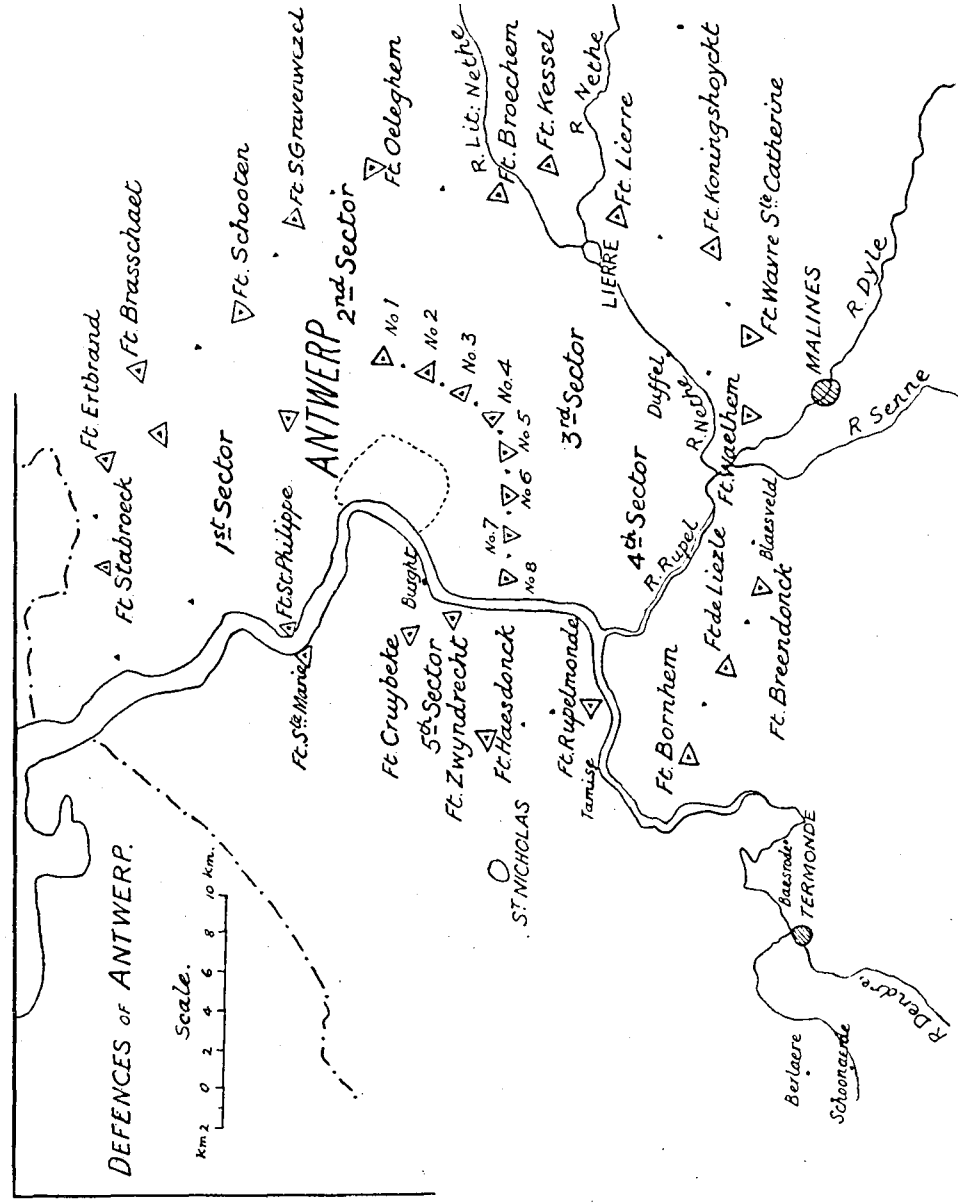
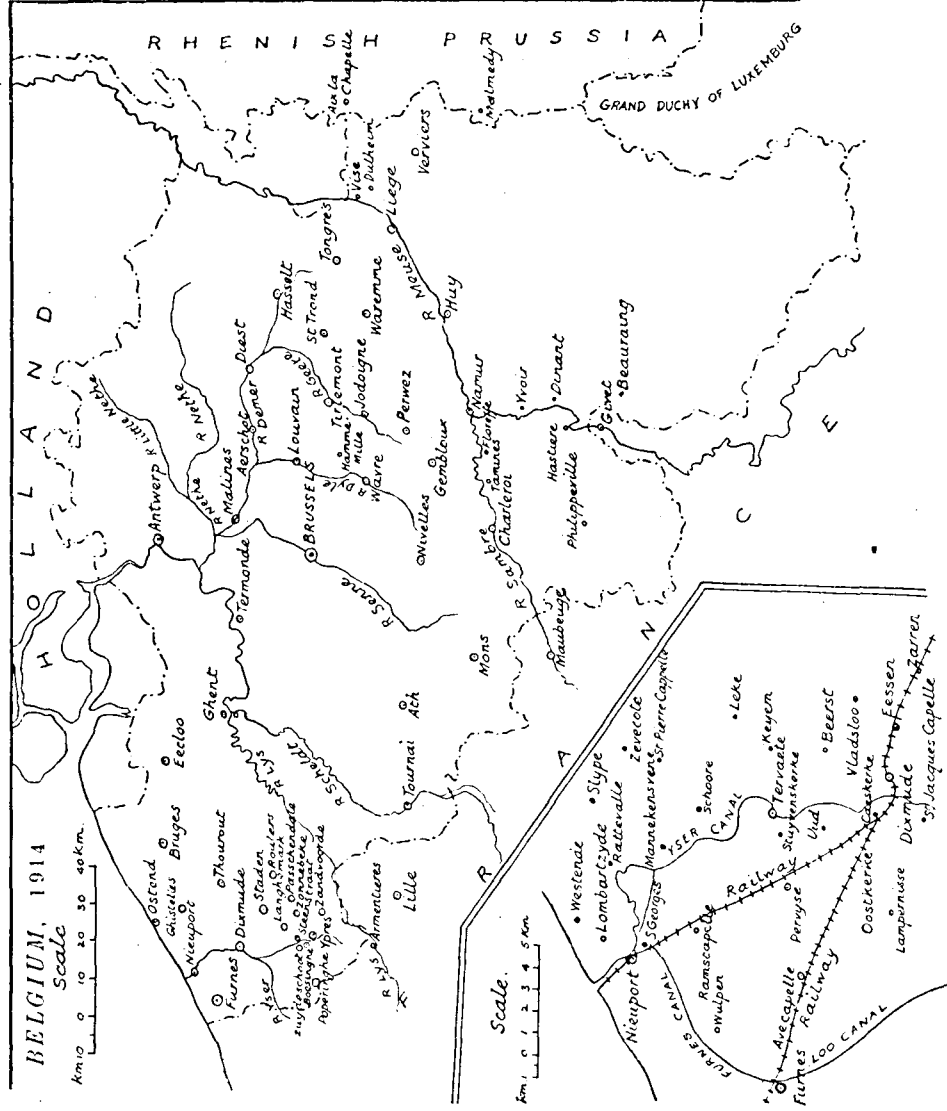
Between the 22nd August and 25th September, the Belgian Army, besieged in Antwerp, had by its sorties effectively co-operated in

improving the strategical situation for the Western Allies ; these sorties had resulted in the Germans retaining before Antwerp forces superior in number to those defending this entrenched camp.

After a retreat of $87\frac{1}{2}$ miles from Antwerp, a junction was finally made by the Belgian Army with the forces of the Allies ; this Belgian Army, with the assistance of a French Division, broke up the offensive of a German Army of 150,000 men.

The Belgian General Staff had, in accordance with the Treaty obligations imposed upon their country, made preparations for the defence of the fortresses of Liège, Namur, and Antwerp, but the enormously powerful artillery possessed by the invaders made a long resistance at these centres impossible.

From whatever point of view the events of the latter half of 1914 are looked at, Belgium at least has the proud satisfaction of knowing that her King and Government have most scrupulously fulfilled every obligation accepted by the little kingdom under Treaties and otherwise ; and further, that it was due largely to the valour of her Army that the situation in Western Europe was saved during the most critical days of the German invasion.



IMPROVEMENTS IN CAMP EQUIPMENT.

By 2ND LIEUT. E. J. MCKAIG, R.E. (T.F.), A.M.I.C.E.

In the September issue of the *R.E. Journal*, various details of camp arrangements were given, that claimed certain improvements and in most cases economy in construction. Here a field cooking range, or complete field kitchen, is described and as before the illustrations are intended to show the type and general arrangement only and are not working drawings.

There are at present many different camp ovens and cooking arrangements, each possessing its own particular advantages, but the rule is invariably to have separate fires for the oven and kitchen. In the system of cooking described here the aim is to utilize the same fire for both purposes, effecting an economy in fuel and altogether a better working arrangement. As will be seen by the accompanying figures, there is no novelty about any part, the originality being in their combination.

Fig. 1 is an iron grid, 6 ft. long, suggested as a standard length, sufficient to accommodate six 12-quart kettles, but the length is not important. This grid is laid upon the ground shown dotted in *Fig. 2* over the ordinary 9-in. trench. The oven (*Fig. 3*) of sheet iron is placed at the end, and the kettles close together upon the grid (*Fig. 4*) forming practically a closed flue connected with the chamber under the oven and the chimney. In *Fig. 2* two trenches only are shown, at right angles. There is no reason for this, it would be better to have three or more, at any convenient angle, a clear way being left for access to the oven door, in which case one could always be used for stopping-off to suit varying winds and improving the draught.

In actual practice the oven may be covered with clay in the same manner as the "Aldershot" and other field ovens are invariably treated, and a small bank of clay along the sides of the kettles might be an advantage. In some positions where trench digging is inconvenient, the grids and ovens can be placed upon sod, brick or clay walls, built up to give the required fire space, but either method makes a good kitchen and the loss of heat is reduced to a minimum, and a great saving of fuel is effected. An addition from a sanitary point of view is brought about by a path of sanitary slabs (see *R.E. Journal*, September), laid at the oven door and along one side of each trench.

In place of the oven a water boiler can be substituted, one of simple construction similar to the oven, but having a central flue. It is suggested that the grids and ovens are made an article of store and of standard size, e.g. (say three 6-ft. grids and one oven make a

kitchen for a given number of men) and duplicated as required. The oven is made collapsible, so that with the flat grids transport would be easy.

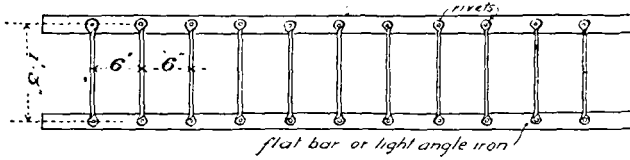


FIG. 1.

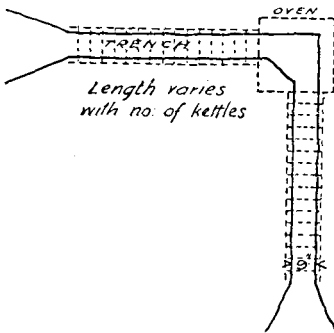


FIG. 2.

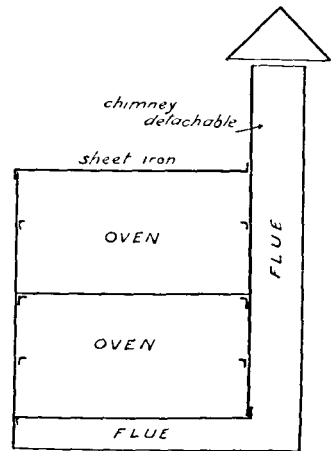


FIG. 3.

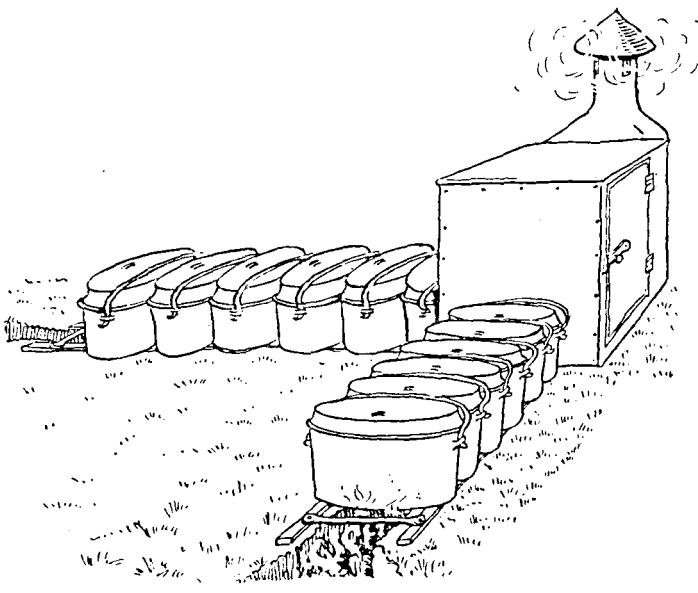


FIG. 4.

*SIEGES AND THE DEFENCE OF FORTIFIED PLACES BY
THE BRITISH AND INDIAN ARMIES IN THE
XIXth CENTURY.*

(Continued).

By COLONEL SIR EDWARD T. THACKERAY, V.C., K.C.B. (LATE R.E.).

THE WAR WITH CHINA, 1860. CAPTURE OF PEKIN.

The cause of this war appears to have been the unwillingness of the Chinese Government to ratify the Treaty of Tientsin, which, according to the provisions of that agreement, should have been completed on or before 26th June, 1859.

On 17th June, Admiral Hope, Commander-in-Chief of H.M.'s Naval Forces in the Eastern seas, appeared at the mouth of the Peiho to announce the approach of the English and French Ministers. The Admiral was told that the passage had been closed by the Militia without the orders of their Government. These untrue representations were supported by false appearances; the batteries of the forts were masked, no banners were displayed, and no soldier was seen. No communication was allowed with the shore. After promising to remove the obstacles at the mouth of the river the Militia repudiated the promise.

Such was the state of affairs when the British Minister, the Hon. F. Bruce, arrived outside the bar on 20th June. Finding that the Chinese officials kept aloof, while the Militia continued to assert that the obstruction was their own unauthorized act, he called upon the Admiral to take such steps as were necessary to reach the capital by the time appointed. This, on the 25th June, the Admiral was proceeding to effect, when the forts, which for eight days previous had appeared deserted, suddenly opened fire on the squadron, the result being that it was repulsed, and obliged to abandon some ships, guns, and *matériel*.

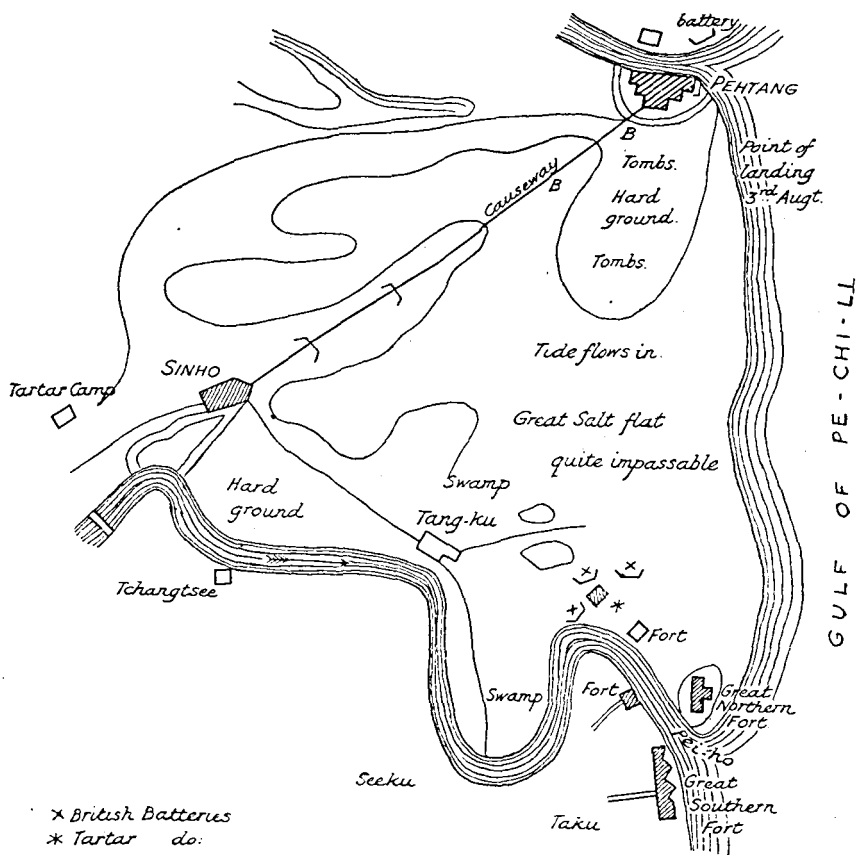
The British and French Governments then entered into a treaty to enforce the Treaty of Tientsin, by force of arms if necessary; and it was agreed that 10,000 English and 7,000 French should be sent to China. Lieut.-General Sir Hope Grant was placed at the head of the *corps d'armée* of two divisions, and Major-General Sir Robert Napier, R.E., commanded the 2nd Division. The French Army had to be despatched from France, the British came chiefly from India. The former assembled at Shanghai, the latter at

Hong Kong, and the British were ready for action by the middle of June. The French were not so forward with their arrangements, and fixed the 25th July as the earliest date on which they could assume offensive operations.

On the 1st August the 2nd Brigade, 1st Division, supported by the French, had landed at Pehtang, a large village situated on a river of the same name, 10 miles north of the Peiho. They experienced great difficulty in getting through the mud, and passed the night on the mud-flats. The 2nd Division remained on board the ships. The forts looked formidable, but no serious opposition was offered to the disembarkation; the chief difficulty was the mud.

SKETCH OF PEHTANG

AND
the Taku Forts.



In the morning the forts and town were taken possession of. The Chinese, before withdrawing, had buried large shells with trains with spring-locks, so as to cause an explosion should the latter be acci-

dentally pressed by the foot. Warning was, however, received in time to prevent damage. On the 3rd August the troops had a skirmish with the Tartars in which Major Greathed, R.E., was wounded.

By the 7th August all the troops had landed. The quarters allotted to the Sappers were found full of putrid matter, the Chinese having killed their animals prior to abandoning the town, and distributed parts of them over the different houses, doubtless with a view to cause a pestilence among the invaders. After making the houses habitable, the Sappers were employed in making a road through the marshes which surrounded Pehtang, and which had been rendered very difficult by heavy rain, so as to facilitate the transit of the heavy guns and baggage to the main embanked road, which led to the entrenchments in front and to the Taku Forts.

On the 9th Capt. Wolseley (afterwards Field Marshal Viscount Wolseley, O.M., G.C.B., G.C.M.G., etc., etc.) reconnoitred to the right by which the enemy's left might be turned. He ascertained that the country in that direction was practicable for all arms.

The allied force left Pehtang on 12th August, and marched in the direction of Sinho, a large village on the Peiho, about 8 miles from its mouth, the Tartars being known to occupy a strongly entrenched position on the lines of march. The 2nd Division went in advance, by the route to the right, to take the entrenched camp in flank. The 1st Division, and the French force moved along the causeway. On approaching the entrenchment, a large force of Tartar cavalry came out and hovered about our flank to charge but without effecting it. Upon one occasion the brigade to which the Sappers were attached was halted, and formed into squares to receive them ; but our fire kept them most effectually at a distance.

Notwithstanding the work of the Sappers, the marsh was so bad that the horses stuck, the guns sank up to their axles, and it was found absolutely necessary to leave behind many of the waggons. The start had been made at 2.30 a.m. and after many hours of hard work struggling against these difficulties, the guns were dragged through about 2 miles of marsh, and eventually landed on hard ground at 10 a.m., when the troops were halted, the enemy being known to be close in advance. After a short rest, the advance was ordered, and the Tartars were soon discovered. In spite of some gallant attempts at charges on their part, they had to retire and leave the Allies in possession of the entrenchment at Sinho ; and the army bivouacked there for the night.

Next day the force moved to the east of Sinho, within 2 miles of the fortified town of Tang-koo. An Engineer Brigade was then formed under the orders of Lieut.-Colonel Mann, commanding R.E. It consisted of the 10th and 23rd Companies, R.E., half of the 8th Company, with A and K Companies of the Madras Sappers.

On the night of the 13th a working party, consisting of details of R.E., and Madras Sappers, and a strong body from the Line, were sent in the direction of Tang-koo, for the purpose of throwing up cover for the riflemen. After reconnoitring the fort closely, the party was set to work, and by daybreak a good line of cover had been thrown up about 400 yards from the fort.

About 6 a.m., the 1st Division advanced to the attack, the English on the right close to the Peiho, while the French attacked the gateway. A strong body of Artillery and Engineers accompanied the force. Among the latter were parties of Madras Sappers, with scaling ladders and powder bags, Lieut. Filgate being in charge of the former, and Lieut. Swanston of the latter. The Artillery opened fire at a distance of 1,500 yards, and gradually approaching the fort, silenced the Tartar fire after a sharp cannonade of three hours. The pontoons and scaling ladders were then called for; but before they reached the ditch, a few riflemen had crept round the work close to the river, and found that the Tartars had fled and were crossing to the south side as fast as they could. Twenty-four guns were taken in the fort. The capture of Tang-koo left us in a very strong position in rear of the Peiho Forts.

The following days were occupied in reconnoitring, and on the 17th the Commander-in-Chief, Sir Hope Grant, determined that the fort to the north of the Peiho should be first attacked. It was nearly square in shape, each side measuring 150 to 200 yards. In the centre was an immense tower of solid earth, on which were mounted three very large brass guns. The whole of the fort was strongly defended by smaller batteries.

The enemy had lost no time in strengthening the land defences; all their heavy guns had been turned round, the parapet had been raised and strengthened with enormous piles, and fresh embrasures and loopholes had been cut. But it was in what may be called its "passive" defences that the fort especially excelled. Throughout a circuit of about a mile the country was intersected by numerous canals and deep ditches, running in every direction. The fort itself was surrounded by three wet ditches, the outer one broad and shallow, and the two inner ones varying in breadth from 20 to 25 ft., and 4 to 8 ft. in depth; the intervening spaces, as well as the berm, were protected by very strong abattis, and by masses of sharp-pointed stones, and bamboo spikes, firmly rooted to the ground.

All were agreed that few places of the kind have ever been more perfectly supplied with obstacles of this nature. Nothing seems to have been neglected. *Trous de loup*, crows' feet, and strong iron spikes were scattered in abundance to impede our progress, while the garrison was defended against night surprises by alarm bells, which anyone attempting to cross the abattis must inevitably sound.

The 18th and 19th August were taken up in preparing small bridges to carry the artillery over the canals and ditches. At 5.30 p.m., on the 19th, a party started to place these bridges in position. The Sappers who were employed on this work were under the orders of Lieuts. Du Cane and Filgate. They returned at 8 a.m. on the 20th having effected their purpose, besides making two dams to shut off the supply of water from the canals.

On the afternoon of the same day, Lieuts. Hime, R.E., and Trail, R.(M.).E., were directed to trace five batteries in positions which had been fixed after the reconnaissance and personal inspection of Sir Robert Napier. This duty was carried out without much opposition from the forts. When night closed in, all the available men of the Madras Sappers were marched out to complete the necessary works before daylight, by which time it was intended that the guns should be in position and ready to open fire. This intention was successfully carried out, and the Tartars did not notice that the English were in position till 4.30 a.m., on the 21st, when they opened fire.

The elevation of the enemy's fire was fortunately too great, and, as by their arrangements they could not readily be altered, their fire did comparatively little harm. Our guns at once returned the enemy's fire, and a very heavy cannonade was kept up for about four hours, when the Taku Fort was somewhat silenced. The 44th and 67th Regiments were pushed forward as skirmishers, followed by the Sappers, etc., with pontoons and ladders. There was some delay in crossing the ditch, owing to the size and weight of the pontoons, and during this slight halt our troops suffered severely from the heavy cross-fire.

The Sappers accompanying the storming party were divided into four subdivisions; the pontoon party under Lieut. Pritchard, R.E. (afterwards Lieut.-General Sir Gordon Pritchard, K.C.B., Colonel Commandant, R.E.); the ladder party under Lieut. Hime, R.E.; the detachment for removing obstacles under Lieut. Trail; and the powder bags under Lieut. Clements, R.E. Once over the ditch, the scaling party were not long in effecting a lodgment in the work, despite the fierce attempts of the Tartars to dislodge them. Lieut. Trail was with the ladder party, and was among the first of those who entered the fort. Lieut. Filgate, with a party of Sappers, was highly praised for the rapidity with which, under a heavy fire, he made a causeway for heavy artillery across a canal close to the fort. The escalade was greatly facilitated by the Chinese coolies from the south; who rushing into the ditch, and throwing ladders across their shoulders, formed a temporary bridge, over which the assailants passed. Many of the coolies were wounded, but instead of retiring to the rear, they took up their position behind the first mound which offered the slightest shelter, and thence viewed the attack going on in front. In the afternoon an advance was made against a second

fort. We were allowed to take possession of it without opposition, and one after another the remaining forts capitulated.

This was a very fortunate circumstance, as almost immediately after heavy rain came on, which so saturated the mud, that moving the guns would have been a task of a very serious nature in the face of the enemy. During the 22nd and 23rd, all the forts on the south side of the river were evacuated and surrendered to the Allies.

It was now thought that the campaign was finished. The 1st Division moved up to Tientsin on the 30th, and the 2nd followed on 1st September. On the advance of the expedition towards Tientsin, orders were given for the demolition of the forts on the south side of the river, while the French undertook the destruction of those on the north.

In accordance with these instructions, the Wasp and Artillery Forts were completely destroyed and the mining of the South Fort proceeded with until stopped by the conclusion of peace at Pekin. Owing to the unexpected interruption of the negotiations at Tientsin, a large part of the force then at that place was ordered to march in the direction of Pekin. The army marched by Poo-kow, Yang-tsin, and Hose-woo, which last place it reached on the 13th.

On the 14th, a mission, consisting of Messrs. Parkes, Lock and a small escort started for Tung-chow. The army moved forward on the 18th. Although carrying a flag of truce, Messrs. Parkes, Lock, and their whole party were taken prisoners, and most shamefully treated. Many of these were cruelly tortured to death. On the 18th, was fought the Battle of Chang-kia-wan, when the enemy were signally defeated, and driven back with great loss on Tung-chow.

Tung-chow was occupied, and the army remained there till the 21st. All this time negotiations were going on with the object, if possible, of rescuing the prisoners in the hands of the Chinese, who were then imprisoned at Pekin. These failed, and at last it was decided that force must be employed. The Engineer operations and the subsequent destruction of the Summer Palace were thus described by Capt. C. G. Gordon (afterwards General Gordon, the hero of Khartoum) in one of his letters :—

“On the 11th October we were sent down in a great hurry to throw up works and batteries against the town, as the Chinese refused to give up the gate we required them to surrender before we would treat with them. They were also required to give up all the prisoners. . . .

“To go back to the work, the Chinese were given until 12 on the 13th to give up the gate. We made a lot of batteries and everything was ready for the assault of the wall which is battlemented and 40 ft. high, but of inferior masonry. At 11.30 p.m., however, the gate was opened and we took possession so our work was of no avail. . . .

"Owing to the ill-treatment the prisoners experienced at the Summer Palace the General ordered it to be destroyed, and stuck up proclamations to say why it was ordered. We accordingly went out, and after pillaging it burned the whole place, destroying in a vandal-like manner most valuable property which could not be replaced for four millions. . . . Quantities of gold ornaments were burned, considered as brass. It was wretchedly demoralizing work for an army. Everybody was wild for plunder. You could scarcely conceive the magnificence of this residence, or the tremendous devastation the French have committed. The throne and rooms were lined with ebony carved in a marvellous way; there were huge mirrors of all shapes and sizes, clocks, watches, musical boxes with puppets on them, magnificent china of every description, heaps and heaps of silks of all colours, embroidery, and as much splendour and civilization as you would see at Windsor; carved ivory screens, coral screens, large amounts of treasure, etc. The French have smashed everything in the most wanton manner. It was a scene of utter destruction which passes my description."

On the 12th and 13th Messrs Parkes and Lock, with a French officer and a Sikh duffadar were released; a few more Sikhs and French were subsequently sent in, and the Mandarins then stated that no more of the prisoners remained alive. They afterwards sent in the bodies of all who had been murdered, with the exception of two, Capt. Brabazon and the Abbé de Luc, who had been beheaded at the bridge of Pa-li-chow, having met the Tartar Army on its retreat on 21st September. The bodies of the murdered prisoners were buried on the 17th with great solemnity.*

Lord Elgin's terms were that 300,000 taels should be handed over by the 22nd October to be distributed among those who had suffered and the families of those who had been murdered. He notified also that it was intended at once to utterly destroy all that remained of Yuen-ming-yuen, within the precincts of which several of the British captives had been subjected to the grossest indignities. Before the 20th Prince Kung was to inform Lord Elgin that he was willing to sign the convention.

On the 18th October the 1st Division, under Sir John Michel, marched on Yuen-ming-yuen, and set fire to all the palaces. On the 19th the fires were still burning, and the wind carried the smoke over our camp right into the city. By the evening the summer palaces had ceased to exist. On the 20th Lord Elgin received Prince Kung's absolute submission. On the 24th the convention was

* Prisoners returned safe—Messrs. Parkes and Lock, Monsieur L'Escoyrac de Lauture, 11 Sikh soldiers, 5 French soldiers; total, 19. Prisoners murdered—Lieut. Anderson, Mr. de Norman, Phipps, K.D.G., Mr. Bowlby (*Times* Correspondent), Capt. Brabazon, R.A., Abbé de Luc, 4 French officers and soldiers, 10 Sikhs; total, 20.

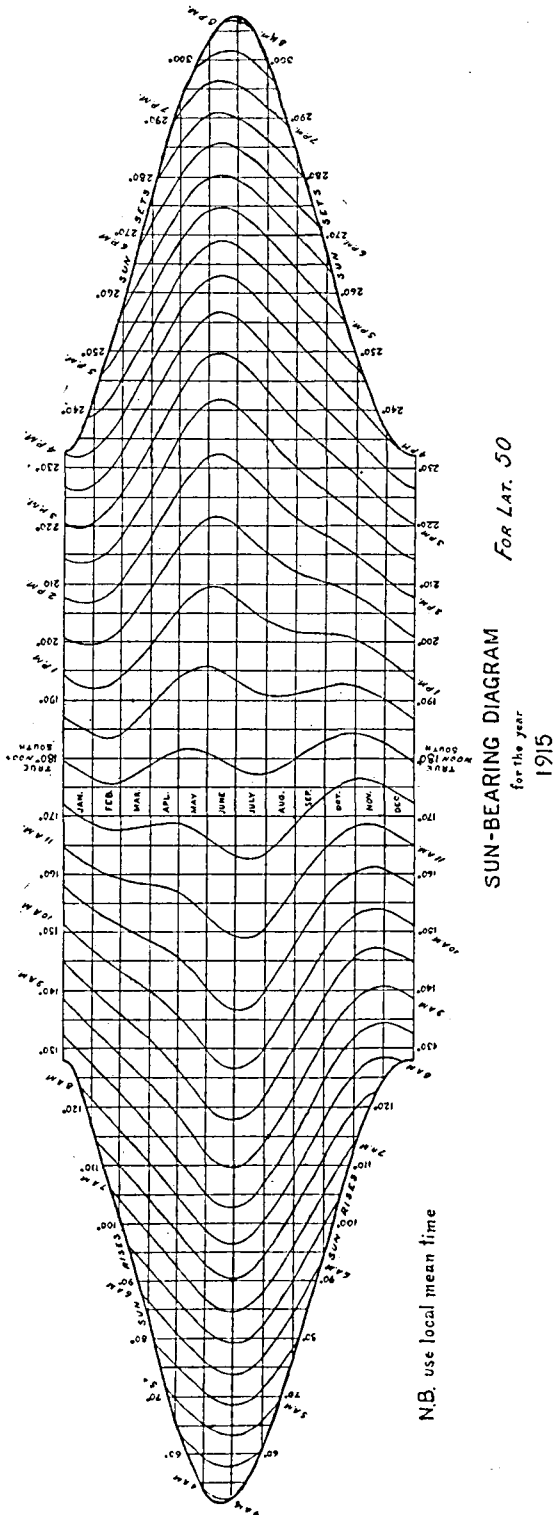
signed by Lord Elgin and Prince Kung (brother to the Emperor). Sir Hope Grant was present at the proceedings, while Sir Robert Napier had charge of the military arrangements connected with them. The French convention was signed next day. Both treaties were afterwards sent to Gehok, where they received the Emperor's signature.

The position selected for our breaching batteries is a point of interest worthy of record. It was about 600 yards to the east of the Au-ting Gate. The guns were to be placed within the high wall which surrounded the Te-tsu or Temple of the Earth. Four 8-in. guns were to make a breach between the second and third square flanking towers east of the gate. Two Armstrong 12-pounders were to play upon the breach, whilst two others fired down the road leading to the gate, two more to be in reserve. A battery of 9-pounders to counter-batter. Our mortars to play on the breach. Our guns were placed on wooden platforms laid down behind the massive brick wall of the Temple. The French had no regular breaching guns, but they hoped to make their heaviest field battery serve instead. Their battery was to our left and only 60 yards from the walls. Ours was 200 yards. Shelter was dug in advance for our infantry, so that the Chinese gunners and the breach should be well plied with rifle fire.

Nothing now remained for the army to do in the north, and the march to the south shortly commenced. The weather in the latter part of the campaign was extremely cold and trying to the troops, especially the natives of India. On the march from Pekin the thermometer at night was often below 20 degrees Fahrenheit.

Sir Hope Grant in a letter to the Viceroy, dated 21st November, 1860, thus writes :—"The two companies of Madras Artillery under Capt. Hicks, and the two companies of Madras Sappers under Capt. Shaw-Stewart rendered good and useful service in the operation which preceded and led to the fall of the Taku Forts. The latter corps was most energetic in working without reliefs at the construction of the batteries. . . ."

SUN-BEARING DIAGRAM.



SUN-BEARING DIAGRAM.

By CAPT. JAS. McEVoy, Canadian Engineers.

THE object of the Sun-Bearing Diagram is to enable a compass to be checked for any unusual local attraction. It is particularly intended for use in places where iron tools or munitions might so affect the compass that the results of an attempted survey might be very misleading.

The hour lines drawn upon the diagram are for local mean time, thus doing away with the necessity for an almanac giving the equation of time. While the hour lines are only drawn for every half hour and the sun's azimuth or sun-bearing lines (the straight vertical lines) are drawn only for every 5 degrees, a careful reading by the eye alone will enable the compass to be tested at least half degrees and a trained eye can be depended upon to get results as close as one quarter degree.

The calculations for the diagram were made for the meridian of Greenwich, but there is no appreciable error for any meridian in Europe. Naturally in order to get the true local time if Greenwich time is used in the field 4 minutes must be added to, or subtracted from, the Greenwich time for every degree of longitude the observer is east or west of Greenwich.

The lines drawn to show the rising and setting of the sun may be used to obtain the local mean time, as these lines also have been drawn so as to do away with the necessity of taking the equation of time into account.

The diagram submitted is calculated for Latitude 50° north, but it can be used for one-half a degree either north or south of that latitude without serious error.

The idea and work of calculation and drawing is original with the writer. The diagram has never been subjected to a critical examination test, but is submitted in the hope that it will fill a want which the writer has many times felt in civil life when working in places badly affected by local attraction. Naturally similar diagrams can be made for any other degrees of latitude.

NOTICE OF MAGAZINE.

RIVISTA DI ARTIGLIERIA E GENIO.

May, 1915.

ON THE VALUE OF PERMANENT FORTIFICATIONS.

Two articles are published in the first number of the *Kriegstechnische Zeitschrift*, 1915, which contain new ideas on fortification and attack. The first is by Frobenius, the other by an anonymous writer.

Frobenius writes: Military engineers should rejoice at the advent of the new very powerful siege artillery, the mortars of 30.5 and of 42 cm., because they know at length with certainty what kind of enemy they have to deal with, while in the past they were constrained to act in doubt. They have always felt suspended over their heads the sword of Damocles, representing the possibility of an entrance on the scene of the most powerful artillery. Now, however, they are able to measure the efficacy of a single shot of siege artillery, and since everything human has a limit it may be retained that the powers of artillery cannot be extended much further, so that the military engineer finds himself facing a well-defined problem.

The fortifications on the northern frontiers of France and Belgium may be subdivided into three groups: those which like Liège, Charlemont, Les Ayelles, Hirson, Longwy, etc., fell after a very short siege; others as Lille, Laon, La Fère and Reims were evacuated on the advance of the German armies; while Namur, Maubeuge, Antwerp were compelled to surrender in 10 or 12 days.

With regard to the first group it may confidently be affirmed that the non-success of the defence may be attributed to the superiority of the attacking artillery who succeeded in occupying the best positions from which they could bring to bear a most efficacious fire against well-defined and visible targets without being fired upon by artillery of equal power. As for the fortresses voluntarily evacuated it may be retained that had they attempted to resist they would have shared the same fate as the first, and it may be said with decision that the fall of Namur, Antwerp, and Maubeuge was essentially due to the attacking artillery. The author draws attention to the conduct of the French troops destined for the defence of Verdun, Toul, Belfort, who showed great activity and took all possible advantage from the favourable conditions of the ground; causing every attempt of the enemy to fail. Those fortresses which became an easy prey to the attacking Germans were completely isolated, abandoned to themselves and by their garrisons. Verdun, Toul, Belfort, on the contrary, were not only defended by their own guards, but were validly sustained by the field army.

The author proceeds: If we desire to be just, from what modern warfare has shown up to now, it may be deduced that a permanent defensive organization is not only useful but necessary. It may also be remarked that besides Verdun, Toul and Belfort, the part represented by the strong forts of Paris have in an indirect manner enabled the supreme French command to drive the Germans from the Marne. Of the value in the strategical field of Przemyśl, Cracow, Königsberg how much is unknown? The fortresses are and always were indispensable, but they ought to be suitably organized to resist the more powerful means of offence. How may this be possible? By satisfying these two conditions: To locate the works so as to hold the enemy at a distance; and by constructing the same works so as not to render them easy targets. The first may be provided by two methods, that is by the most active offensive action of the garrison, and by arming the forts with artillery of great calibre.

Whilst, up to now, it has been held sufficient to arm the forts with guns of small and medium calibre, we ought to be persuaded of the necessity of the possibility of arming them with cannon of great calibre. With the huge guns with which the forts should be armed it would be necessary to obtain such ranges that would keep the mortars and the shells of the attack very far from the said forts and in a condition powerless against the fire of the guns of the fort.

With regard to the method of constructing the forts with a view to rendering them not easily destroyable, the author contends that it is useless to increase the thickness of the armoured covering to obtain greater protection against each cannon shot of the enemy's artillery. For this there is only one way, that is to follow the lines of field fortification by diminishing the targets, concealing the ground, and breaking up the elements as much as possible.

This is the method of permanent fortification with which the Germans now commence to fight. But there is need to record that all the fortresses of Belgium and France which were left to themselves were soon conquered; and only those which acted in strict unison with the field army have been able to present a good resistance.

The anonymous author commences his writings by saying that he is more than ever convinced that permanent fortifications are still necessary for the defence of the country. They should be able to resist for long on determined points or in regions of special importance, with small forces the forces, greatly superior to them. And it is obvious that they will serve such a scope, so much the better, as they are properly located, and their power of passive resistance will be so much the greater as is the power of their arms and equipment. As much as is the defensive organization of the fort, so much the less will be the part of the field army necessary for guarding it, and on the contrary so much the greater will be the forces of the enemy arrested in front of it.

The arguments which, since the experience of modern wars, are brought forward in support of the theories which consider permanent fortifications as impotent in the face of the new and very effective methods of attack have no serious foundation. There are indeed some

who in their enthusiasm for the value of trenches and field fortifications, think that the latter can be substituted for permanent fortifications.

Do they not lose their senses?—exclaims the author—Do they not forget how much France owes to its fortifications? Do they not lose sight of the very great value of the German fortresses on the western frontiers in event of the troops being obliged to retire?

It should be remembered that fortresses may grow old in the same manner as ships of war. At this point the author expresses as follows the ideas according to which by his advice the permanent defence of a country should be organized.

For the purpose of properly defending its own territory against invasion a state should limit itself to constructing, near its frontiers, some fortresses and assigning to them certain special duties. As an efficacious assistance to the mobile defence by the troops, and for the absolute security of a state against an enemy's invasion, especially in a territory with open frontiers, a system of forts connected by extended lines of passive and insuperable obstacles, natural and artificial, is the only one of service. For such a system, an organization of vast entrenched camps, like those of the French at Belfort and Verdun, is not necessary; extended battle camps with permanent works are sufficient; such as will admit between their intervals of the offensive action of the troops and against which the enemy's attacks may be split up and broken.

Such a system of battle camps with permanent works should be adapted to tactical requirements in the same manner as improvised fortifications. The military engineers instructed in the duties of defending a certain zone, and holding account only of this, and of the nature of the ground, should determine the position and the structure of the necessary works, independently of any preconceived ideas. Case by case it should be decided how best such permanent battle camps can be organized, either with a line of forts or with groups of works, without rigidity, and without being strictly tied to a linear system or to that of groups. In each camp there should be strong closed works, well armed, well equipped, secure against assaults, *di viva forza*, and with great development of fire, constituting the nucleus of the whole system.

The author attaches a sketch to his article, representing one of such modern places of support, protected according to his principles, noting that the data referring to the various dimensions are only vague indications, especially as regards the thickness of the armoured protection. For general rules he offers the following:—

- 1st. To maintain a most efficacious fire action against the vicinity of the attack, even up to the last stage.
- 2nd. To support the contiguous works, fighting the intervals with batteries conveniently disposed.
- 3rd. To be absolutely secure against attacks *di viva forza*.
- 4th. To be able to impede the enemy from establishing himself in the interior.

A successful defence up to the last stage can only be effected by the following means: mitrailleuses and special guns of small calibre; the

use of the strongest armoured protection for the guns and the garrison ; the concealment from view and the disposition of such protection.

It would be difficult to construct a gallery for infantry and mitrail-leuses with armoured protection without it being visible. Small protected emplacements concealed by bushes, for one or two mitrail-leuses, might be preferable. Armour-covered batteries should be provided for supporting the neighbouring works by their fire, and be placed between the closed works in the positions best adapted for the purpose. Passive security should be obtained by a very extended use of barbed wire, with current at high tension, guarded by small armoured posts. To impede the enemy from establishing himself within the works there should not exist in the ditch any small places in which he could take up a position against the reserve batteries of the defence.

The author closes his article with a remark on the ungrateful duty of endeavouring to find a compromise between the principles which he recommends and the expenses spent on construction.

June, 1915.

THE STORMING OF PRZEMYSL BY THE RUSSIANS.

Extracted from the *Danzers Armee-Zeitung*, Vienna :—

The two periods of the Siege of Przemyśl by the Russians extended over 165 days ; about three weeks for the first and four and a-half months for the second. In the first period attempts were made to capture the fortress *di viva forza* ; these attempts failed, and efforts were then made to starve out the garrison. Before October the attackers lost 70,000 men ; and at least 35,000 in the second period of the siege.

This fortress which cost such a sacrifice of life to the attack was not a strong place of the first order among modern fortresses. It is over 40 years since the works of Przemyśl were erected and the more important works of the fortress date from 1880. They were remodelled during successive periods of 10 years, but the armament was not modern ; only two mortar batteries of great calibre were of recent pattern ; the great mass of the artillery comprised a variety of types, some of the guns dating back to 1861. Most of the garrison were men of the old classes of Galician and Hungarian troops ; and among the artillery were men of the Viennese Landsturm.

The defence under General Kusmanek had, in the two periods of the siege, been one of wonderful activity, compelling the Russians in the second period to remain in their own fortified position, and to exercise great caution in bringing forward their troops, and to borrow from Japan many guns of large calibre to contend against the works of the fortress.

The services rendered by the Austro-Hungarian field army at Przemyśl were very great. It had a difficult duty to perform in bringing up reinforcements and ammunition as there was a decrease in the distribution of these which could not be replaced before the 5th November. Provisions were scarce, and in the second period of the siege the

garrison was reduced to half rations, and it became clear to the commander, who always remained in communication with the supreme command by means of wireless telegraphy and aeroplanes, that subsistence would not last beyond the middle of March. Since the arrival of reinforcements from beyond the Carpathians could not be absolutely counted upon, and the sortie of the 19th March intended to break through the Russian lines having failed, General Kusmanek received orders to surrender the fortress to the enemy, after destroying all the means of defence. The surrender of Przemyśl took place on the 22nd March without great advantage to the Russians.

GERMANY.

Compensation for the Recovery of Munitions and other Materials.

An order of the German War Minister contained in the *Verordnungsblatt*, N. 14, of the 2nd March last fixes the compensation that will be paid either to soldiers or civilians who recover parts of munitions and other materials from the battlefields. These compensations tend to show with what care Germany seeks to economize as far as is possible all materials that can be utilized for the fabrication of munitions, and for other military purposes.

1st. For private individuals the following compensations :—

(a). For objects of brass such as rifle cartridge cases and damaged artillery cartridge cases, per each kg., lire 0'60.

Aluminium, copper, zinc :—

(b). For artillery cartridge cases (undamaged), per each kg., lire 1'80.

(c). For rifle cartridges complete, per each kg., lire 0'30.

(d). For tins for provisions, etc., per each kg., lire 0'06.

(e). For fragments of projectiles with copper parts, per each kg., lire 0'035.

(f). For iron objects and fragments of projectiles without copper, per each kg., lire 0'01.

2nd. Soldiers receive for material recovered only one-fifth of the compensation established for civilians.

It will be the duty of all to be careful that in the search for materials by the soldiers there must be absolutely no avoidance of service.

3rd. Compensation will be paid only to those who by their own labour procure material for the military authorities, which by the same authorities would otherwise be considered as lost.

4th. For metals and for other substances that constitute booty of war (as for example the munitions of a stormed fortress) no compensation will be paid.

The German Submarines.—The *Génie Civil*, N.17, gives the information that at the beginning of 1914 Germany possessed 24 armed submarines and 14 in construction. Of these last eight have been completed. The six remaining (Nos. 33 to 38) whose construction was commenced in 1914 are not probably even now on service despite of the feverish activity displayed in 1914 in the German dockyards. The German submarines are designated by the letter U followed usually by a number

(U-4 for example). The letter U is the initial of Unterseeboot, signifying submarine. It seems that Germany has kept for itself five submarines built for Austria, and one destined for Norway, so that at the commencement of the War 38 submarines were available. The first German submarine is stated to have been launched at Kiel in 1905. The essential details which characterize the German submarines are shown in the following list :—

Particulars.	U ₁	U ₂ to U ₈	U ₉ to U ₁₂	U ₁₃ to U ₂₀	U ₂₁ to U ₃₂	U ₃₃ to U ₃₈
Year of placing on the stocks	1903	1906-07	1908	1909-10	1911-12	1913
Displacement at the surface, tons	185	237		450	650	675
Ditto, immersed	240	300		500	800	835
Length, metres	39.10	43.20		?	65	?
Width, metres	3.60	3.75		?	6.10	?
Effective power of electric motors for subaquean navigation	200 h.p.	320 h.p.		600 h.p.	800 h.p.	?
Effective power of petrol motors for subaquean navigation	400 h.p.	600 h.p.		1200 h.p.	1800 h.p.	2500 h.p.
Greatest velocity at the surface, knots	11	12		15	16	17
Ditto, below the surface of the water	8	8.5		9	10	?
Radius of action on the surface	?	{ 1,200 miles.		?	{ 1,500 miles,	?
Ditto, below the surface		{ 50 miles & 5 knots		?	{ 70 miles and 6 knots	?
Armament	{ 1 tube torpedo. 3 torpedoes of 450 mm.	{ 2 tube torpedoes. 4 torpedoes of 450 m.	{ 2 tubes. 4 torpedoes of 450 mm.	{ 2 or 3 tubes. 4 or 6 torpedoes. 1 gun of 37 m.	{ 4 tubes. 8 torpedoes. 2 guns of 88 m.	?

Slightly superior to type U-2.

I. Five submarines built for Austria of the same characteristics as those of type U-33, U-38.

II. A submarine destined for Norway similar to type U-9. It appears, that up to the end of 1914 20 new submarines were under construction.

In 1907 Germany only possessed eight submarines, including those completed and under construction, while France possessed 85. But from time to time France lost this advantage owing to many being put out of service, on becoming obsolete and unfit for the sea. Germany, on the other hand, proceeded with great caution, as though it would seem to be disinterested in the question, leaving to others to make the more difficult trials; and when the usefulness of small ships became certain, Germany set to work to build as many as possible, so that while in 1907 the allotment for submarines was about 6,000,000 lire, in 1910 the sum allotted had risen to 18,000,000 and in 1914 to about 24,000,000.

Austria-Hungary commenced to build in 1907, and at the commencement of the War she had six armed and four under construction at Pola, which when completed were numbered from 12 to 15. The first six were numbered 1 to 6. The numbers wanting, from 7 to 11, were due to five having been constructed in Germany and kept there.

E. T. THACKERAY.

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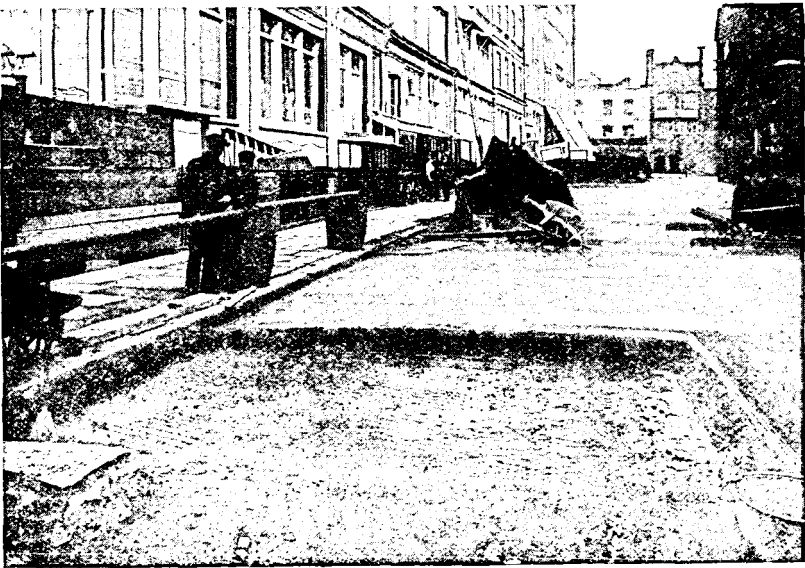
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