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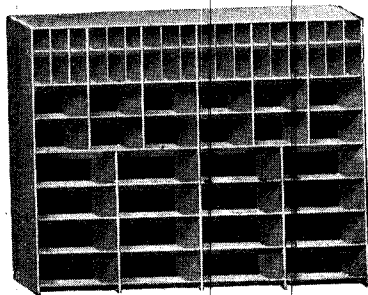
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*Authors alone are responsible for the statements made and the opinions expressed in
their papers.—(G. 5281).*

DEEDS OF THE ROYAL ENGINEERS.*

(Continued from the May number of the “R.E. Journal”).

CHAPTER VII.

THE 23RD COMPANY, ROYAL ENGINEERS, AT LADYSMITH.

THE following account of the company during the war in South Africa is extracted from the *R.E. Journal* of November, 1903 :—

Officers embarked with unit :—Major S. R. Rice (became C.R.E., Middleburg District, May, 1901) ; Capt. G. H. Fowke (appointed Director of Public Works, Transvaal, May, 1901) ; Lieut. E. V. Turner (transferred to 1st Telegraph Division, April, 1901) ; Lieut. H. L. Meyrick (transferred to the 17th (Field) Company, April, 1900) ; Lieut. R. J. T. Digby Jones (killed at Wagon Hill, 6th January, 1900) ; 2nd Lieut. G. B. B. Denniss (killed at Wagon Hill).

Officer attached :—Lieut. R. E. Meyricke (Division Officer, Pietermaritzburg).

Officers subsequently posted :—Lieut. C. Mellor (April, 1900) ; 2nd Lieut. G. A. P. Brown (April, 1900) ; 2nd Lieut. N. W. Webber (April, 1900) ; 2nd Lieut. A. W. Stokes (April, 1901 ; invalided home September, 1901) ; Capt. C. de W. Crookshank (May, 1901 ; appointed Staff Captain, Middleburg District, September, 1901, and subsequently Adjutant, Central South Africa Railway Volunteers) ; Capt. R. H. Macdonald (September, 1901) ; Capt. H. B. Jones (March, 1902).

Up to the declaration of war the company was employed on purely peace work, the principal work being the construction of a hospital.

BEFORE LADYSMITH.

On 15th October, 1899, three days after the expiry of the Boer ultimatum, No. 1 Section, under Lieut. E. V. Turner, proceeded to join the detached force under Major-General Sir W. Penn Symons at Dundee. They were present at the action of Talana, and returned to Ladysmith with the rest of the force on October 26th.

The remainder of the company started work on the construction of defences for Ladysmith, Major Rice being appointed C.R.E.

On the 30th October the company, under Capt. G. H. Fowke, took part in the Battle of Lombard's Kop, as part of the general

* Compiled in the R.E. Record Office.

infantry reserve under Colonel W. G. Knox, R.A. ; it accompanied two mountain guns to Observation Hill, to assist, if possible, the detached column on Nicholson's Nek ; it came into action at long range against the enemy posted on the line Surprise Hill, Thornhill's Kopje, etc., and remained in this position until late in the afternoon, when further advance of so small a force was found impossible. Major Rice on this day was in command of Section A (Eastern Force) of the defence.

DEFENCE OF LADYSMITH.

The communications were finally cut on the 2nd November ; and from this date until the relief on February 28th, 1900, the 23rd Company (the only R.E. Company with the beleaguered force*) was continuously employed making, adding to, and strengthening the works in all parts of the various sections of the defence.

From an early date in the siege defence work had to be carried on almost entirely by night, and under most unfavourable conditions as to nature of ground and available tools and material. New works, batteries, etc., were located and traced during the day by C.R.E. and the officers for night duty. So long as the number remaining fit for duty permitted, one officer was detailed for duty in each section of the defence. The N.C.O.'s and Sappers were employed assisting section commanders and officers in charge of posts, being reinforced by natives under Mr. King and Mr. Brook, of the Natal Public Works Department. With the rest of the garrison the Sappers became so weak from sickness and starvation that towards the end it was found economical to convey them to their work in wagons for any distance over $\frac{1}{4}$ mile ; in spite of all they displayed such determination and self-sacrifice as to merit the personal thanks of Sir George White, G.O.C., Ladysmith.

A few brief details of work done during the defence may be of interest.

Many emplacements, magazines, bombproofs, etc., were constructed for the naval 4.7 in. and 12-pr. guns and for the 6.3-in. howitzer and R.F.A. guns. For the 6.3-in. howitzer four pairs of sunken and concealed emplacements were built, and one of the 4.7-in. guns had to be shifted eight times.

Seven electrical minefields were established and some 60 mines laid ; these consisted of $4\frac{1}{2}$ lbs. of guncotton in waterproof bags, to be fired from one central station in each field. Mines of various mechanical patterns were also put down. There was no opportunity, however, of actually firing either description in earnest.

A line of strong abattis, with barbed wire interwoven, was erected round the south end and west face of Cæsar's Camp and Wagon Hill, extending continuously for some $2\frac{1}{2}$ miles on the southern side of

* Except the 2nd Balloon Section, R.E.

- the enceinte. Entanglements and crinolines of barbed wire were formed round guns, etc.

Two bridges for all arms were constructed across the Klip River. One, near Rifleman's Post, was a low-level one on piers made of boulders and bags of concrete, the roadway being tied down to the piers with strong chains; it successfully withstood high floods washing over it and remained in working order throughout the siege. The other bridge (alongside an existing low-level one called Camp Bridge) consisted of 10 spans of 19 ft. each, the roadway being supported on single trestles weighted with bags of concrete; on January 6th, 1900 (the day of the great attack by the enemy on Wagon Hill), the water rose 3 ft. above the roadway, which had been built 10 ft. above ordinary water level, and the whole bridge was carried away. It was not rebuilt, but the old bridge was repaired and made serviceable.

A wire sling bridge with cage was made at Rifleman's Post to maintain communication during floods; it proved very useful on January 6th in allowing reinforcements to be passed over, when the above-mentioned bridge was under water.

A flying pont was established in February between Poundberg and Pavilion Hill; it was made out of two company pontoons, and worked by a bridle and pulley on a wire cable consisting of seven telegraph wires twisted together, the span being 300 ft.

Two artillery roads were constructed to the top of Cæsar's Camp; also roads to Cove Plateau and to Maiden Castle Redoubt, the latter requiring blasting work along almost its whole length of 800 yards.

GUN HILL SORTIE.

On December 7th Capt. G. H. Fowke, Lieut. E. V. Turner, and four N.C.O.'s accompanied a small force of Imperial Light Horse, Natal Carabineers, and Border Mounted Rifles under Major-General Sir A. Hunter (Chief of the Staff) to make a night attack on the enemy's position on Gun Hill. The position being surprised and captured, the R.E. destroyed one 6-in. B.L. Creusot gun and one 4.5-in. howitzer; the charges used in each case were 6 lbs. of guncotton at the muzzle and 4 lbs. at the breech; the destruction in each case was apparently complete, but it is believed that the Creusot gun was made serviceable again in the workshops at Pretoria.

SURPRISE HILL SORTIE.

On the night of December 10th Lieut. R. J. T. Digby Jones with three N.C.O.'s and Sappers accompanied another small column of four companies of the 2nd Rifle Brigade under Lieut.-Colonel Metcalfe of that battalion, which captured the enemy's position on Surprise Hill. On this occasion one 4.5-in. howitzer was destroyed. During the retirement the column was attacked, and the R.E. casualties

were Sapper Hibbard and 2nd Corpl. Berry wounded, the former mortally.

WAGON HILL.

The following account of the enemy's attack is contained in a report from Major Rice to the Chief Engineer, Natal :—

“Thirty-three N.C.O.'s and men of the 23rd Company left our camp at Ladysmith for night-work on Wagon Hill; Lieut. R. J. T. Digby Jones was the officer in charge. Their duties were to make a second (or upper) emplacement for a naval 12-pr. gun; to assist in mounting a 4·7-in. gun which was coming that night from Junction Hill, in the sunken emplacement already prepared; and to fix a platform in the lower 12-pr. emplacement.

A working party of 50 infantry was also provided for Lieut. Digby Jones. They joined at Wagon Hill without arms, and left at 2.30 a.m. on the 6th on completion of the work required from them.

A party of 10 R.N. under Mr. Sim, R.N., assisted by working party of 100 infantry, was detailed for the movement of the 4·7-in. gun. In addition, an escort of 70 infantry was provided.

The permanent garrison of that end of Wagon Hill consisted of 25 Imperial Light Horse with two officers.

At about 5 a.m. on the 6th a report reached our camp that the enemy were on Wagon Hill and that Lieut. Jones' detachment had been captured. This was the first intimation we (R.E.) had of any attack. The firing of guns had been heard for about half an hour previously, but at that period of the siege this was not an unusual occurrence.

In case of attack the orders were for the C.R.A., C.R.E., etc., to proceed to headquarters. But in view of the report I thought best to ascertain personally what had occurred; so I rode out as quickly as possible, meeting Lieut. Digby Jones on the top of Wagon Hill at 5.45 a.m.

Our men were then lining the front ridge of the plateau (Wagon Hill, W.), exchanging a hot fire with the enemy on their front and left flank; and Major Miller-Wallnutt, Gordon Highlanders, was present and in charge. 2nd Lieut. G. B. B. Denniss, the officer detailed by me for duty with that section of the defences, had already arrived.

Lieut. Digby Jones gave me a very clear and full report of what had occurred within his observation up to the time of my arrival. I have also heard the statements of various N.C.O.'s and men of his party. In the following brief account of what occurred throughout the day I have relied on these reports in connection with anything recorded that did not come within my personal observations.

On the arrival of the various parties at Wagon Hill, West, on the night of the 5th, work proceeded as usual until 2.45 a.m. on the 6th, when, without previous warning, musketry fire was opened on

them from the outer crest line of Wagon Hill proper, on their left flank, at a distance of about 150 yards.

At that time Lieut. Digby Jones and about 25 of his party were working at the upper 12-pr. emplacement. The remaining 8 were fixing the platform in the lower 12-pr. emplacement at the west extremity of the hill, distant about 70 yards.

Digby Jones at once ordered the party to stand to their arms, which were piled by them; kicked over the lanterns, which were evidently attracting the enemy's fire; extended his men from right to left; and opened fire in return on the place whence they were being fired upon.

The R.N. who were near the 4.7-in. emplacement also stood to their arms under Mr. Sim. The party of Imperial Light Horse also fell in with their officers. Some of the Gordon Highlanders fell in with Digby Jones's party.

Naturally a good deal of hurry and confusion occurred at first; but none of the parties mentioned above ever left, or were driven off, the top of the hill. Both I.L.H. officers were wounded almost at once, and Lieut. Digby Jones took command, remaining in charge of the various parties until 5.15 a.m., when reinforcements (I.L.H. and Gordon Highlanders, under Major Miller-Wallnutt) commenced to arrive.

Shortly after the action opened Digby Jones pushed his men forward about 40 yards, with bayonets fixed, and occupied the outer crest of the hill; the I.L.H. also moved forward; and the R.N. party, with the 8 Sappers, occupied the lower 12-pr. emplacement and the outer crest of the right flank. The reinforcements, on arrival, took up practically the same position and absorbed the original defenders.

In my official report to the Chief Staff Officer I brought to notice the steadiness of the men and the great coolness and resource shown by Lieut. Digby Jones in the trying circumstances in which he was suddenly called upon to act.

I think I may draw attention too in this account to the value of the rule, which obtains in this unit, of never allowing the men, under any circumstances to leave their camp for work without taking their arms with them and of insisting on the arms being piled close to them whilst at work.

Firing on both sides continued heavily before and after my arrival on the spot. We R.E. had several casualties at this time, principally from the fire of a small party of the enemy (about fifteen I was afterwards told), who were lying among the rocks on the left flank, on the outer slopes of Wagon Hill proper, about 200 yards off. Other units suffered equally.

At about 9 a.m. it was decided to attempt to turn out these men by a bayonet charge by the troops on Wagon Hill proper, and at

Major Miller-Wallnutt's request I formed a section of R.E. and R.N. at the lower 12-pr. emplacement, to support the charge by firing volleys on a knoll about 900 yards on our left front, whence the enemy were protecting by rifle fire their comrades above mentioned. I placed Mr. Sim, R.N., in charge of this party. The attempt was made and failed, Lieut. Todd, King's Royal Rifles, being killed.

Shortly afterwards firing on both sides slackened, and at about 10.15 a.m. ceased almost entirely. The situation then appeared to be that the attack had been completely beaten off. I was informed that it had been decided to leave the small party of the enemy on the outer slopes of Wagon Hill proper until nightfall, when they could be effectually dealt with. They were considered to be cut off from the rest of their forces. This assumption afterwards proved to be wrong, as they could be, and were, reinforced under cover of the banks of a donga which ran almost up to the position they occupied.

At about 11.15 a.m. I rode into Ladysmith to report myself at Headquarters. Before leaving I told Lieut. Digby Jones that, if Major Miller-Wallnutt had no objection, he might collect his men near the 4.7-in. emplacement and give them some food which I had sent in for. This he did; and fortunately so, as the party was re-formed in time for the attack made shortly afterwards.

After reporting at Headquarters I returned to Wagon Hill, arriving there about 1.30 p.m. Near the 4.7-in. emplacement I met some of my men. The senior N.C.O. reported to me that both Digby Jones and Denniss were killed, and that they had had several other casualties.

It appears that about mid-day the attack was renewed. A small party of Boers suddenly appeared within a few yards of the men on the outer crest, about 15 yards from the 4.7-in. emplacement, evidently having ascended unperceived from the lower part of the outer slope. After a few rounds a panic seized the defenders, and they retired in disorder and confusion to the rear crest, and in some cases down the rear slope of the hill.

Two Boers (Field Cornets de Villiers and de Jagers, I believe) then advanced to the 4.7-in. emplacement, in and around which Digby Jones and his detachment were resting and having some food. Apparently the retirement of the infantry defenders had been unnoticed by them, and the first intimation they had of the enemy being on the top of the hill was a shot, delivered over the parapet at a distance of a few feet, which killed 2nd Corpl. Hunt, R.E.

In a moment Digby Jones picked up a rifle, dashed round the end of the epaulment, and killed de Villiers; Lance-Corpl. Hockaday, R.E., at the same time shot de Jagers dead.

Digby Jones was then heard to say, "What's up? The infantry have gone." A man replied, "There is an order to retire, sir."

Jones said, "I have had no order to retire." A sergeant of the I.L.H., who was near them, said "Don't let's retire, sir, let's give them Elandslaagte again." I think this sergeant's name was Howard, he was killed afterwards.

Digby Jones at once ordered bayonets to be fixed, and, calling on his men to follow him, led them (with Denniss) at the charge, reoccupying the firing line in front of the 4'7-in. emplacement.

Some Boers were seen by our men disappearing down the slope as they advanced. Heavy firing recommenced on both sides.

After a short time the men who had been driven from the front were reinforced and moved forward into their places again. I think it was then that Major Miller-Wallnutt was unfortunately killed, but I am not sure as regards this point. At all events the Sappers were ordered back to the 4'7-in. emplacement, and were gradually withdrawn as the infantry came up. These latter had no officer with them (owing to casualties, I believe), and Digby Jones, acting under orders, went out to the centre of the ridge with the object of moving the men well forward at that point to their proper firing position. While performing this duty he was struck by a bullet in the throat, which killed him immediately.

Shortly afterwards Denniss was heard to say, "I hear Mr. Digby Jones is hit; I am going to see to him." He was afterwards seen moving about on the sky line carrying a stretcher. I found the bodies of these two most brave and promising young officers lying close to each other about 15 yards in front of the upper 12-pr. emplacement.

On my arrival I re-formed the R.E. in reserve in and around the 4'7-in. emplacement. Firing continued heavily throughout the afternoon, the enemy's guns on Rifleman's Ridge and Middle Hill sending many shells, both common and shrapnel, on to this part of the position. Rifle fire was also heavy, and we had many casualties. At 4.30 p.m. a very heavy rainstorm broke, accompanied by violent thunder and lightning. The firing on both sides, instead of slackening as I expected, became more intense, and it was evident that some crisis was approaching. I therefore ordered my men to fix bayonets and be ready. We did not then muster more than about a dozen all told.

I saw the men in the firing line fall back singly and in twos, until about 5.30 p.m., when I heard confused shouts of "Retire," and the whole line rose and doubled towards the rear crest of the hill. In this retirement I saw several men fall and it seemed as if the enemy had gained the front crest; I have heard that some were actually on top, but I did not see any myself.

We then pushed to the front and got to the firing line, turning back as far as we could the men who were leaving; in a few minutes the remainder of the men who had left, being finely rallied by a young

officer of the King's Royal Rifles (2nd Lieut. Reid, I afterwards ascertained), returned at the charge, cheering and with bayonets fixed, and resumed their positions. I did not see any of these men get behind the rear crest of the hill, and I have no doubt that they were nearly all misled by the shouts of "Retire" to which I have alluded.

After this the fire gradually slackened; and the charge of the Devons on Wagon Hill proper removed the party of the enemy, who, at a range of about 200 yards, had been the cause of most of our losses on Wagon Hill, W. They had completely enveloped us, and most of our killed and wounded were hit on the side of the head or body.

Nothing further of importance occurred in this neighbourhood, and at nightfall the infantry at Wagon Hill, W., were relieved by dismounted cavalry, 18th Hussars, and 5th Dragoon Guards. A detachment of the former regiment had been brought up to Wagon Hill, W., at mid-day under Major Knox, and were in reserve on the reverse slope of the hill throughout the afternoon, except a small party, under Capt. Haig, which was in the lower 12-pr. emplacement.

At about 6.30 p.m., with the approval of General Ian Hamilton, I sent into Ladysmith for a fresh detachment of 33 N.C.O.'s and men with 2 officers; they were brought out by Lieut. Turner. On their arrival I took what remained of Lieut. Digby Jones's party back to camp, which they reached at 10.30 p.m., after 28 hours' continuous work and fighting.

I returned to Wagon Hill at midnight in anticipation of further fighting, but none occurred.

The names of several N.C.O.'s and men were specially mentioned by me in my official report; and I think it will be admitted that all of Lieut. Digby Jones's party did their duty in a way that reflects credit on themselves and their Corps.

The following were our losses :—

Killed.—Lieut. R. J. T. Digby Jones.
2nd Lieut. G. B. B. Denniss.
Sergt. C. Jackson.
2nd Corpl. R. Hunt.
Lance-Corpl. H. Bailey.
Sappers Simmons, Bland, and Cox.

Wounded.—Sappers McCarron, Powell, Catchpole, Hudson, and Rutt."

The relatives of Lieut. Digby Jones were subsequently awarded the V.C. for which he would have been recommended had he survived.

During the siege the company lost 2 officers and 8 N.C.O.'s and men killed in action, and 12 N.C.O.'s and men died of disease.

DESIGN FOR A HORSE-WATERING POINT.

By MAJOR ARTHUR A. CROOKSHANK, R.E.

HORSE-WATERING places may be divided into two kinds, the muddy mouth type and the not quite so muddy mouth type. Watering points built during months when there is not much humidity in the atmosphere do not give much trouble; when the floor or standing breaks up and gets bad the trough can be picked up and shifted a short distance along the pipe line.

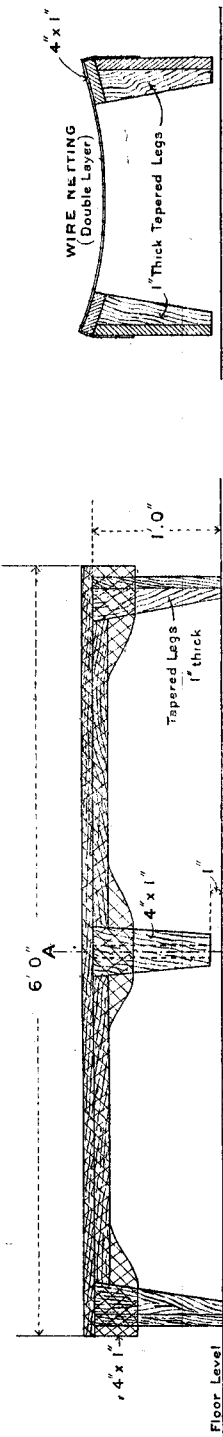
In the damp months however it is necessary to provide a hard flooring; cases have occurred of horses being drowned in the deep liquid mud which the ground is very rapidly converted into.

The flooring in this design is of forest timber—2 in. thick if of inside cuts, and 3 in. thick at the corners if of outside cuts—founded on three long ground sills with chalk filling in between. This flooring is sloped inwards at 1 in 20 to a corrugated iron drain, which also takes the drips and spills from the water trough, and the rain water.

The trough is of sheet iron, made in continuous lengths of 25 ft. and of full cross section throughout. The top edges of the trough have to be made strong against both horizontal pressure by the horses and vertical pressure by the men using them to mount off.

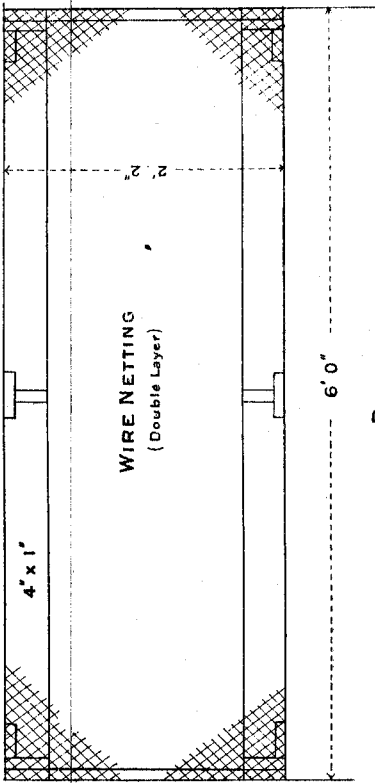
Troughs made of tongued and grooved boards are difficult to make watertight; those lined with waterproof canvas, or ordinary canvas tarred or roofing felt are seldom watertight for long, and also have a short life, as the lining soon gets holed or rubbed through.

Troughs made in short lengths of 12 to 15 ft., and connected by piping or otherwise choked or throttled down, are not satisfactory, as they take longer to fill, and therefore reduce the rate of watering and output of watered animals.



FRONT ELEVATION.

CROSS SECTION ON A-B



PLAN.

DESIGN FOR BILLET BED.

By MAJOR ARTHUR A. CROOKSHANK, R.E.

THE inevitable result of a long period of movement-less warfare is that the standard of comfort, luxury or what are considered as necessities is always being raised; each winter it is higher than the last, and the third winter finds it at its limit.

Furniture is a dangerous subject to discuss from the R.E. point of view, but in any case, this design, which is by Major A. C. Finnimore, R.E., is a very good illustration of the fact that in engineering it is always worth while, it always pays (and indeed it is necessary) to work out and think out the smallest details, even in the smallest items, so as to be thorough all through, and to arrive at efficiency with the minimum expenditure of material.

The bed is made of 4 in. \times 1 in. planking throughout, this being the only timber which was available at the time; the four corner posts or legs are made of angle wood, the two central legs of tee wood; all the legs are tapered down from top to bottom. The runners or bearers are placed on the skew, the inclination should be a tangent to the curve which the double wire netting assumes when it has finished stretching and has taken up its permanent set. Placing the bearer at an angle also gives it the required horizontal strength.

The central legs are made 1 in. shorter than the others. This gives the bed a spring, makes it pliable, and consequently much more comfortable; it also prevents rocking when the floor is uneven. The tapering in the legs also reduces the chances of rocking.

This same principle (of shortening the central support) is applied when designing billet benches or forms.

Perhaps one of these days the Finnimore school of furniture will be as well known as the Chippendale, Sheraton, or Adam schools, in which the practical utilitarian side of furniture was rather lost sight of, and everything sacrificed to the decorative and æsthetic sides and to art (in some cases so-called art).

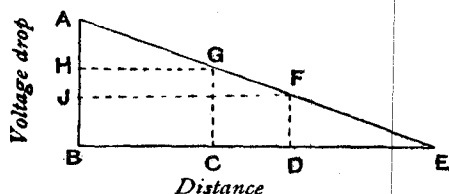
OHM'S LAW GRAPHS.

By MAJOR A. D. ST. G. BREMNER.

AT many stations small electric-lighting distribution schemes for camps or barracks, etc., have often to be prepared where the source of power or feeding point is on or near the site. These schemes are usually on the two-wire system and generally include a main cable, two or three sub-mains and several branches therefrom, each with different lengths and currents. A total permissible voltage drop at full load from the source of supply to the furthest lamp has first to be decided upon, in order to prevent undue variations of the potential differences at the lamps, when some are not switched on, causing the candle powers to vary excessively.

This drop may be about 2 per cent. to 4 per cent. of the supply voltage according to the nature of the installation. Probable extensions of the system should always be allowed for and this can be suitably effected by reducing the permissible drop decided upon by the percentage of probable extension.

Having fixed the total drop permissible, the difficulty is then to apportion this satisfactorily and economically to the several parts of the system. It usually entails much calculation and juggling of cables mingled with trial and error to get the various drops correct and even then one is never certain that the most suitable and economical arrangement has been obtained. There is, however, a very simple method, which is never stated specifically in text-books, and it is based on the principle that the most economical arrangement of any small distribution scheme on the tree or branching system, as opposed to the ring or network system used in larger schemes, is obtained by making the voltage drop vary directly with the length of the cable, no matter what the current may be which that cable has to carry.



To explain this principle more clearly, in the above figure let AB represent the total permissible voltage drop, and BC, CD, DE be the

respective lengths of the main, sub-main and branch cables. These cables will of course have different currents in them at full load according to the nature of other branches coming off. We must consider the longest portion which will give the greatest drop. Join AE, erect perpendiculars at C and D, meeting AE at G and F respectively, and draw GH and FJ parallel to BE. Then AH represents the voltage drop for cable BC, HJ for cable CD, and JB for cable DE. It must be noted that the size of cable required to obtain the permissible drop is nearly always larger than that necessary to carry only the maximum current at full load.

At the end will be found a sheet of Ohm's Law Graphs devised by the author some time ago, which gives the solution of the above problem graphically and also other simple problems in Ohm's Law. The examples given with the diagram clearly explain the method of its use.

For voltage drops with alternating current it will give sufficiently accurate results for practical purposes.

As the nature and nomenclature of service cables is more or less in the melting pot at present, no service identification of the cables shown is given, but the sizes of conductors are easily identified and include practically all the cables that can be obtained within the limits specified.

It should be noted that the current-carrying capacities are for rubber insulation. Other insulating materials entail a slightly different carrying capacity.

MEASURES TO BE TAKEN TO PREVENT CONTAMINATION OF FOOD BY FLIES.

By JOSEPH CATES, M.D., D.PH., M.O.H., St. Helens.

THE following valuable paper was read at a Sessional Meeting of the Royal Sanitary Institute at St. Helens, February 17th, 1917.

Whatever view we hold with regard to the so-called fly campaign, we shall be unanimous in agreeing that there is only one natural cause of death, old age. If we agree to this, we shall further agree that children should not die, for the death of a child is not a natural death. Thirdly, we shall agree that children should not be poisoned by the food they take. The majority of deaths from food poisoning in children is brought about by gross contamination of food by flies. This interesting conclusion may be arrived at by the study of the number of deaths from summer diarrhoea occurring in England and Wales in the different quarters of the year. Food infection gives rise to disease under many names; the two outstanding symptoms of food infection in children are sickness and diarrhoea. With regard to the magnitude of the latter is it a disease which causes two or three deaths in a district or can it be looked upon as an important slayer of children? There is no doubt that if we consider the figures this disease is a wholesale slayer, and the need for doing everything possible to combat it is urgent. It is estimated that the average worth to any community of a single life is £250 to £300, consequently every district is to that extent poorer when a life is lost. A simple calculation will show you that the loss of children's lives from summer diarrhoea since the beginning of the twentieth century, sixteen years, has cost this country about £100,000,000. With reference to these deaths from infective enteritis there is another important point, and that is the illness caused by the disease. Not only is death a loss to the community, but illness is also a serious loss. The illness from summer diarrhoea is very much larger than most people suppose. I doubt very much whether in an industrial town like St. Helens one thousand persons during the summer escape an attack of infective enteritis. The disease is at its height in the third quarter of the year, when flies are most active, and as they become inactive the deaths disappear.

When local authorities have abolished the open ashpit, they will have done a tremendous amount in breaking the link between the

infective child and the clean healthy children. We have seen during the past eight or ten years what is, in my opinion, a most regrettable step in health matters. The first retrograde step was taken when a second Government department took upon itself, or had thrust upon it, matters relating to public health. We saw the medical inspection of school children placed under the Board of Education. A little later there was another sub-division of health work; one disease, important, but no whit more important than many diseases that were passed over, was picked out and placed under a special committee for treatment, viz., tuberculosis, at the time the National Health Insurance Act was passed. Later on we saw certain other diseases singled out for treatment and placed under other committees. Later still another branch of health work has been split up and placed under another committee, viz., infant welfare work. I feel that we can carry sub-division too far, and the point will arise when we come to the sub-division of the unit, and by-and-by in health matters we shall be dealing with decimal points. The formation of special committees might even be extended to measles and whooping cough, and I view with very much alarm the institution of such new bodies dealing with public health. There will probably be later on a condition which the writer of the Athanasian Creed perhaps had in mind when he said there would be a dividing of the substance and a confounding of persons, and I implore those who have influence in this matter to do anything they can to get public health matters gathered together and placed under one central authority.

Every year in England and Wales some 23,000 deaths occur from diarrhoea and enteritis, and of this number about 20,000 are in children under five years of age. Since the beginning of the century a population larger than that of Bradford has been destroyed by these preventable diseases. Few diseases are more easily within the control of local sanitary authorities, and none reflects more clearly municipal shortcomings. Unpaved yards and passages, ill-swept streets, infrequent removal of house and stable refuse, the so-called conservancy system, the earth-closet and the open ashpit, each plays a part in swelling the total of the slain.

If sanitation is without influence on the rate at which children die, how comes it that towns notoriously insanitary have an infant death rate four or five times that of clean well-governed cities, that in the certain overcrowded slum areas the children die six times as rapidly as those in better-class residential districts, that among 1,000 infants born to unskilled labourers only 700 survive the first year of life, while out of the same number of births 960 babies of professional men reach their first birthday?

If the causative organism of diarrhoea and enteritis is to be found in decomposing filth, particularly that of human origin, why does the death rate from these diseases suddenly increase during the third

quarter of the year? The answer has been supplied by the investigations of Niven and other workers in the field of preventive medicine, who have shown that a prevalence of flies is closely followed by an increase in the number of deaths from summer diarrhœa, and that as the flies disappear, or become inactive, the epidemic passes away.

In considering the question of prevention, due regard must be given to the three fundamental factors of the soil, the seed, and the sower; the soil is the infant, the seed the infecting organism as yet not certainly discovered, the sower is in most instances the fly.

In the first place, it is our duty to attempt to improve the condition of the soil so that it will resist the growth of the seed, and to this end a child should have the right to suitable and sufficient clean food, adequate periods for sleep, a properly ventilated bedroom with no overcrowding, and skilled medical treatment, with skilled nursing assistance.

Secondly, we must do all in our power to reduce the prevalence of the seed by converting the earth-closet and open ashpit to the water carriage system, by insisting on the provision of closed ashbins instead of the open ashplace, the paving of yards, the effectual cleansing of streets and passages, and the regular and frequent removal of refuse.

Further, recognizing that the heavy mortality in the summer and autumn is occasioned by direct contamination of food by flies, it is essential vigorously to attack this important channel of infection.

There are about twenty species of house-frequenting flies, but the common house fly and the lesser house fly seem to make up over ninety per cent. of the fly population found in houses during the height of the fly season.

A female house fly will lay about 120 eggs in one batch, and may lay four or five batches. The eggs are deposited in clusters on the surface or just below in fermenting vegetable matter or in refuse which is likely to ferment; hatching of the larvæ occurs within four days, and may be as rapid as eight hours if the temperature of the refuse is sufficiently high.

Immediately the larvæ issue from the eggs they burrow out of sight. About eight days later the white crawling maggot becomes a pupa, but the larval stage may in some cases be prolonged for eight weeks. The flies emerge from the pupæ within eight days, and the females may be laying eggs three weeks from the time that the eggs from which they were hatched were deposited. The part taken by the fly as the sower of infection is largely mechanical; while assiduously walking over filth and fæcal matter the fly gathers on its legs and footpads disease-producing germs, and then contaminates the surface of the material on which it next alights. Moreover, the fly

feeds upon particles of decomposing matter, and thus its alimentary canal becomes a store house from which bacteria are distributed.

Obviously the first step in the control of fly-borne disease is to prevent flies from breeding. Stable manure must therefore be stored in fly-proof receptacles, which must be emptied at least once a week during the summer and autumn. Other likely breeding places must be searched for and appropriately dealt with. House refuse must be placed in closed ashbins, emptied at frequent intervals, and the contents destroyed by fire. At the onset of warm weather an organized attack must be directed against the first fly of the season, and the nooks and crannies of houses, stables, and other outbuildings must be explored for the presence of the foe.

To free a house from flies there is nothing equal to the sticky fly paper of narrow width, or lengths of wire or string dipped into some suitable adhesive substance. Wire cages or glass vessels baited with attractive material can be kept in each room, and those possessing the necessary energy should knock down flies on the wing with suitably constructed weapons. A little paraffin added to the water with which windows are cleaned is an excellent deterrent, and the paint-work may be wiped over with a cloth moistened with the same liquid.

All food, particularly substances such as milk, sweets, and fruit which are consumed without cooking, should be screened from contamination by flies.

In houses some protection can be afforded by a suitable fly-proof safe or food cupboard, and by metal or gauze screens.

In shops fly-proof windows and glass cases can be used, and muslin screens freely employed. In certain trades more use should be made of cold storage chambers, and meat and fish during the summer months ought not to be exposed to the dust and dirt of streets.

Fortunately the knowledge that there is danger in the consumption of food contaminated by flies is no longer confined to those engaged in public health work, and the day is not far distant when purchasers will refuse to enter a shop where flies may be seen crawling over the articles offered for sale.

The presence of flies constitutes a grave menace to the health of the people and the life of the children. Typhoid fever, dysentery, summer diarrhoea, and enteritis, some forms of tuberculosis and many other diseases can be conveyed by flies, and it is imperative therefore that local sanitary authorities and every householder should strive to remove one of the most serious dangers that an infant has to face.

MEMOIR.

LIEUT.-COLONEL JAMES HALIFAX WESTERN, C.M.G., LATE R.E.

ON April 2nd, 1917, Lieut.-Colonel J. H. Western, C.M.G., late R.E., leaving a fine record of useful work behind him, went to join his former chiefs in the rest which they all have so well earned; or, perhaps, to planes of higher activities which may suit their energetic natures better than rest. It is just a year since Sir Colin Scott-Moncrieff, his chief in India and Egypt, had left before him. His other chiefs, General H. A. Brownlow, Colonel W. H. Greathed and Colonel J. G. Forbes, had gone on more in advance—all names of renown in the irrigation records of India.

Colonel Western was born in 1842. After passing through the R.M.C., Addiscombe, and receiving his commission in the Royal Engineers, he went to India in 1862, and a year later commenced his career as an irrigation engineer of the Indian Government on the Eastern Jumna Canal, N.W.P., under Sir Colin Scott-Moncrieff. From 1870 to 1875 he was Executive Engineer of the Northern—the most important—Division of the Ganges Canal. Here he left his mark by the improvements he effected in the head works on the Ganges at Hardwar, including the construction of the regulating dam across the river branch opposite the town. In addition he carried out protective measures on the large cross drainage works, and the remodelling of the numerous falls on the first 50 miles of the Ganges Canal, with other subsidiary works.

At the end of 1875 he was selected to succeed Colonel Helsham-Jones, R.E., on the construction of the Narora Weir on the Ganges River opposite Aligarh, and of the first reach of the Lower Ganges Canal—very extensive and difficult works, which he, endowed with the experience gained on the Eastern Jumna Canal, completed with great success. Referring to this period of Colonel Western's Indian career Colonel E. W. Creswell, late R.E., writes in terms of admiration of his untiring energy and of his great powers of administration and practical foresight; and adds this testimony: "Major Western won the respect and devotion of all those who served under him, and no greater testimony can be adduced to his tact and manage-

ment than the fact that happiness and contentment always reigned at Narora."

Colonel Western, as Superintending Engineer, was next put in charge of the new Betwa Canal, and consequently was responsible for the construction of the great Paricha Dam across the Betwa River, near Jhansi. Here he displayed his sound judgment in altering the site of the dam from that originally chosen, after much discussion, to a site where the river was of wider section and sound rock offered itself for a foundation.

In 1882 Colonel Western was transferred as Superintending Engineer to the Punjab Irrigation Branch, where he was the prime mover in the satisfactory development of the distribution system on the Sirhind Canal. He held this appointment till he was lent, at Sir Colin Scott-Moncrieff's special request, to the Egyptian Government.

Mr. J. S. Beresford, C.I.E., who, with Colonel Creswell, has supplied the foregoing facts of Colonel Western's career, adds the following appreciation of him:—"The general feeling of all who knew and had worked with Western in Northern India, was that of great respect for his judgment and ability. In difficult situations, when there was little or no reliable information to go on, he seemed to have the faculty of always taking the right course." Colonel Sir John W. Ottley, K.C.I.E., writes that whatever Western had to do, he did well; and mentions his habit of rising at unearthly hours in camp and starting long before dawn, so that it became the custom to announce the departure to the wives left behind in bed by calling out "Fine starlight night and all's well."

It was in consequence of the high reputation which Colonel Western earned for himself as an engineer in India that Sir Colin Scott-Moncrieff selected him to superintend the work to be undertaken in Egypt with the £1,000,000 that, in 1885, the Great Powers, on the urgent representation of Sir Evelyn Baring (afterwards Lord Cromer), allowed Egypt to borrow for irrigation works. So Colonel Western came to Egypt bringing with him the late Mr. A. G. W. Reid as his able assistant.

The most important work in Egypt was then, as now, the barrage at the apex of the Delta. The barrage—now called the Delta Barrage—consists of twin regulators, one astride of either branch of the Nile, immediately below the point of its bifurcation into the Rosetta and Damietta Branches. Its construction was begun in 1843 and it was nominally finished in 1861. When tested with a head of water in 1863, and again in 1867, water passed under the floor and the collapse of the work was threatened. Consequently the barrage was put on the sick list and finally reckoned unfit for service. So it was found by Sir Colin in 1883. It served as a bridge across the Nile to the convenience of traffic, but not as a regulator

of river levels and discharges in the service of irrigation. After some experimental tests of a practical nature in utilizing the barrage as a regulator, made by Sir William Willcocks from 1884 to 1886, and after an examination of a certain length of the foundations under Colonel Western's direction in 1886, it was decided to do the bold thing and undertake the restoration of the whole barrage and to render it capable of holding up a four-metres head of water. This is no place to describe the work of restoration, but the following quotation from a Note by Sir Colin will serve to indicate, in a general way, the difficulties that had to be met :—

“(1). All the time we were mending this barrage, we were obliged to be using it. The great head of water held up made it doubly difficult to keep the springs down to give a dry floor to work on. If we had been building a new work, or if we could have postponed irrigation till the barrage was ready, our task would have been much easier. It was like mending a watch, and never stopping the works. (2). Our working season was always a very short one. The state of the river flood never allowed us to begin till November. The first thing was to enclose the portion to be operated upon by great earthen banks. These banks had in one case to be made in water 50 ft. deep. They took always more than two months to make. Then the water inside had to be pumped out. We were lucky if this was finished and the new work could begin by the 1st March. Then it continued without intermission, day and night, till the end of June, when we had to prepare for another flood. It was clear we could never shut off the whole stream from either branch at the same time, and in one working season we could not repair the whole of either barrage; so the work divided itself naturally into four seasons, half a barrage each season.”

The work was finished in 1890, and the barrage was returned as fit for duty and active service. For the successful completion of this most difficult work Colonel Western and Mr. Reid were both made Companions of the Order of St. Michael and St. George, honours thoroughly well earned. Later on, in 1909, Colonel Western was awarded the 1st Class Medjidie by H.H. the Khedive.

Unfortunately Colonel Western's health broke down in 1889, and in February, 1890, he left the Egyptian service, a few months before the final completion of his work. On his return to England he became Inspecting Engineer to the Egyptian Government, which post he held till 1909.

After he had left Egypt, he was, nevertheless, always consulted on important matters affecting the barrage and his advice was invariably followed. The peculiar operation of consolidating the barrage foundations by cement grout, for instance, was not undertaken before his approval had first been sought and obtained.

In Egypt, as in India, Colonel Western earned the reputation of

- (vi.). They have taken shelter behind women.
- (vii.). They have made their civil prisoners suffer martyrdom.
- (viii.). They have, in order to provide excuses for their conduct, lied against and calumniated their enemies.
- (ix.). Conclusion.

The pages of this volume make sad reading and their perusal excites the deepest indignation against the perpetrators of the dastardly acts chronicled therein. No punishment, known to civilized people, seems to be sufficiently severe to mete out either to the miscreants who are responsible for instigating the deeds recorded in this volume or to those who actually committed these deeds.

In the section headed *Conclusion*, the compilers of this volume state that their first object in giving prominence to the information contained therein is not that of inciting French soldiers to commit similar atrocities ; reprisals as a means of revenge they consider to be unworthy of them. They seek rather to expose the atrocious side of the Teuton Monster, in order that measures may be adopted to prevent him from repeating the offences which he has been guilty of committing in the name of *Kultur*. They have a second object ; their countrymen owe a sacred duty to the memory of those who have been martyrs in their cause. When the War is over it will not be sufficient to commemorate the names of these martyrs on tablets of stone or of brass. As soon as liberated humanity resumes its normal labours the Germans, it is expected, will reappear in every sphere of commerce, industry, finance and science in all those regions where men congregate ; then will be the time that the countrymen of these martyrs will need reminding of the deeds committed by the invaders of Serbia, Belgium and France in the years of Grace 1914—1916. To accept the advances of those—and their descendants—who have been guilty of the offences brought to light would be to betray these martyrs ; thus to forget them would be an act of complicity in the deeds which caused their terrible sufferings. If these deeds are remembered by future generations in Belgium and France there is, at least, some hope, that a striking moral reparation will be obtained in respect of the dastardly conduct of the German Army and authorities which has been so strongly reprobated in the original reports referred to earlier in this review.

The 117th number is entitled *Lille*, 1916, and is practically a reproduction of the Second French Yellow Book. A preface has been contributed to this number of the series by Monsieur Henri Welschinger, of the *Institut de France*. This preface is in itself in the nature of a review of the Second French Yellow Book which opens with the instructions, dated 25th July, 1916, issued by the French Foreign Office to the Diplomatic Agents of the Republic, directing them to call the attention of the Powers to which they were accredited to the treatment which the German authorities had meted out and were meting out to the people of Lille, Roubaix and Tourcoing, treatment which was in direct violation to the provisions of the Hague Conventions.

Monsieur Welschinger tells us that, amongst the official documents relating to the present War, one of those to which the greatest importance

being a sound and safe man. The Irrigation Staff from Sir Colin downwards placed great confidence in him. His advice was frequently sought by seniors and juniors alike, and was readily given to either. It was felt that to seek and follow his advice was to adopt a factor of safety that would give security against all risk of failure. He had a profound dislike to anything approaching self-advertisement, and esteemed such ceremonies as official inaugurations of works to be but vanity. He was content to do good work—the best work, and to know that it was good.

HANBURY BROWN, *Major, late R.E.*

REVIEWS.

PAGES D'HISTOIRE, 1914—1916.

(Librairie Militaire Berger-Levrault, Paris: 5, Rue des Beaux-Arts).

Continued from R.E. Journal for May, 1917.

The 116th number of this series is entitled *Leurs Crimes*; it is published under the patronage of the mayors of a number of French towns. An introductory notice to the volume has been contributed by Monsieur L. Mirman, Prefect of the Department of Meurthe et Moselle, Monsieur G. Simon, Mayor of Nancy, and Monsieur G. Keller, Mayor of Luneville. These gentlemen inform us that this volume is a book of horrors, but alas, it is at the same time a book of truth. The contents of the volume have been culled by them from the three following sources:—

(1). The four reports of the French Commission of Enquiry relating to the Violations of the Laws of War by Germany published by the French Foreign Office.

(2). The two volumes containing the 22 reports of the Belgian Commission of Enquiry and the reply of the Belgian Government to the German White Book of the 15th May, 1915.

(3). The notebooks taken from the persons of a large number of wounded German soldiers, N.C.O.'s, and officers who fell into the hands of the French and from others of the same ranks taken prisoners; these documents are exceedingly valuable as containing the recorded confessions of the experiences, etc., of the writers thereof and form veritable *pièces à conviction*.

The volumes referred to above represent a formidable charge sheet against the German Army and authorities, and although it is desirable that every page they contain should be carefully studied, nevertheless it is recognized that their very bulk places them out of the reach of the public at large. However, in order that this public may have some idea of the nature of the contents of the reports in question extracts have been made therefrom and are republished in this little volume so as to be accessible to the widest circle of readers.

The volume is divided into nine sections headed as follows:—

- (i.). They have stolen.
- (ii.). They have committed arson.
- (iii.). They have committed murder.
- (iv.). They have done violence to women and children.
- (v.). They have killed the wounded.

- (vi.). They have taken shelter behind women.
- (vii.). They have made their civil prisoners suffer martyrdom.
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Monsieur Welschinger tells us that, amongst the official documents relating to the present War, one of those to which the greatest importance

must be attached is the Note of the French Government addressed, on the 27th July, 1916, to the Neutral Powers. The text of this note is published in the Second French Yellow Book and is reproduced in the volume under review. In this document are contained the charges made by the French Government in relation to the execrable acts of violence committed by the German authorities against the people of the Departments of Northern France in the occupation of the German Army; these charges are supported by sworn statements, many of which are reproduced textually.

Monsieur Welschinger examines and comments upon the atrocious proceedings directed against the unhappy people who have temporarily come under the rule of the Hun. The French Government have on frequent occasions been obliged to make representations to the Neutral Powers in regard to the offences, opposed to the dictates of humanity, which have been committed by German troops. For example, on the 22nd August, 1915, the French Foreign Office informed the Spanish Ambassador at Berlin that French subjects were being employed on war work and had to submit to an iron discipline of the most arbitrary nature, and to acts of violence and cruelty of the most odious kind. The measures most recently adopted by the German authorities, it is pointed out, are still more inhumane. Under the orders of General Gravenitz, assisted by the 64th Infantry Regiment, sent expressly from Verdun for the purpose, 25,000 French subjects, consisting of girls, young women, and men belonging to every grade of society were torn from their homes at Tourcoing, Roubaix, and Lille and were brutally separated from their families. These wretched people were forcibly employed on agricultural and other work in the Departments of the Aisne and Ardennes, and it was given out that they had undertaken such work voluntarily, a misrepresentation of facts which caused them to be subjected to insults and maltreatment. Details are given of the measures adopted by the Germans for rounding up, collecting and despatching these unhappy people from their native towns to unknown destinations. These unfortunate people appear to have been subject to worse treatment in the matter of the railway accommodation provided for them, than would be permitted in connection with the movement of cattle in this, or any other, civilized country. The Germans have justified their action by alleging that the measures adopted were forced upon them by the difficulties created by the attitude of Great Britain in provisioning Belgium and northern France. The true facts of the situation are that Germany alone is responsible for the privations being suffered by the population in the occupied territory, and she has systematically utilized the labour of these unfortunate people to serve her own ends and to derive the fullest profit therefrom in the interests of her army. She has deliberately violated every engagement into which she entered in connection with the Hague Conventions.

The selection of the persons who were to be expelled from Lille, Roubaix and Tourcoing was left in the hands of military officers at these places, and by all accounts they acted with a refinement of cruelty one would not have expected to find in the educated classes of any country. Machine guns were drawn up in the streets to intimidate

the victims of these acts of aggression ; young girls, brought up in refined homes under the most careful supervision, were herded with women of the lowest moral character ; the time chosen for this forced exodus was Passion Week. It is said that in spite of the brutality of the soldiers and the vulgar jests of the officers the French people, in the area under eviction, behaved admirably. Naturally, here and there, some of the less educated of the people gave vent to their exasperation, as in the case of a labourer's wife, who, on being torn away from her husband and children cried aloud : " Cursed be your race, your women and your children."

To add to the misery of the unhappy people thus driven from their homes, the poorest fare was supplied for their sustenance ; a small quantity of mouldy black bread, thin dirty soup, and a small portion of tough meat. The appeals of the hungry people for eatable food were met by their gaolers with jeers and the frequent repetitions of the three words : *Das ist Krieg*. They were also told with derisive mockery that their labour would be rewarded in *Bons payable by Monsieur Poincaré*.

Untrue accounts have been issued of these proceedings by the German Government in order to mislead the public in neutral countries as to their real nature. The German Press naturally supports the measures adopted by the military authorities, and a Hamburg paper has not hesitated to record its opinion that *it is not the duty of the German Government to feed people who have been abandoned by their own government*. The *Tag* has even gone further ; it has expressed the view that in war *the greatest absence of scruples is in fact the highest degree of humanity*. *Hesitation and temporization, sensitiveness and consideration are unpardonable weaknesses. Decisive action taken without scruple represents force and therein resides victory*. Mathias Erzberger, who is responsible for the foregoing views, was awarded the Iron Cross for his courage in proclaiming the same. The foregoing views are but a repetition of the maxims of Treitschke, of Von Bülow, of Von Bernhardi, of Delbrück, of Lasson and of many another apostle of Germanic *Kultur*.

Monsieur Welschinger asks whether, in face of the foregoing abominations committed by the Germans and disclosed once again in the New Yellow Book, Neutral Powers will still maintain an attitude of indifference ? In one country, at all events, the patience of the public is being exhausted. A large body of Swiss have presented a petition to the President and Council of the Helvetic Confederation, in which they protest against the deportations and other violations of the Law of Nations by Germany.

There are indications that in other neutral countries also the record contained in the French Note, of the 27th July, 1916, has caused feelings of revulsion against the cruelties practised by the Germans.

The King of Spain has personally intervened on behalf of the inhabitants of Lille, Roubaix and Tourcoing, and it is hoped that the hard lot of the unhappy people will have been somewhat mitigated owing to his intervention.

The greater part of this volume consists of Appendices containing the evidence in support of the charges laid by the French Government in the Note in question.

The 118th and 121st numbers contain the official communiqués issued by the Central Government to the provincial authorities in France ; they are the XXIII. and XXIV. Volumes of the series dealing with this matter. The 118th number covers the communiqués issued in September, 1916, and the 121st number those issued in October, 1916 ; each of these numbers is provided with Appendices, containing information relating to the principal events occurring during the month covered by the communiqués contained therein.

The 119th number is entitled *Autres Chants de Soldats*. Monsieur A. Sauvrezis provides an introduction to the Soldiers' Songs contained in this volume ; he reminds us that *a sad army would indeed be a sorry army* to put one's faith in. He asks the question : " Why are we fighting ? " And replies : " Because a foreign people claim to impose upon us their material and moral yoke ; they claim to dominate, to be masters of our territories and of our thoughts. We will liberate, by a military victory, our invaded provinces—and with no less of ardour, we will liberate our intellectual existence."

He tells us that the literature and the works of French genius give proof of French personality ; the popular music of France, with its accents of sincerity, reveals more than anything else the character of her people. In the years preceding the War, musical art seemed to be losing itself in France in useless complications and excessive subtleties ; the War, with its terrible realities, has rescued it from the false path into which it was straying.

" In order to think with precision, man should," says Monsieur Sauvrezis, " always place himself at the threshold of his tomb."

" Song," he continues, " does not die with the man ; every living being is impelled towards song to give expression to his joy, to his sorrows, to his aspirations whether heroic or religious."

Music is not something superficial ; it can give expression to the whole gamut of human sentiments. It can indicate that which is most noble, the most inspiring, the most mysterious in the soul of man. Consequently, in this cataclysm, at a time when so many human beings are living so near the brink of life, music plays a most important rôle ; it keeps life company, it intensifies it and renders it more harmonious. The following are the maxims which Monsieur Sauvrezis inculcates :—

" Soldiers, if ye are sad, sing, your sorrow will be dispelled by your song.

" Soldiers, if ye are marching, sing, the kilometres will slip away with your song.

" Soldiers, if ye are weary, sing, your blood will course more quickly with the rhythm of your song.

" Soldiers, if ye are merry, sing, the old exuberance of France will be revived with your song.

" Soldiers, if ye charge, . . . still continue to sing, victory will be the more enduring and the more telling in accompaniment to your song."

This volume contains 46 songs, composed between 1260 and 1916, each song being accompanied by the score of its tune ; among them being included the National Hymns of Poland, Portugal and Roumania.

The volume concludes with a short note on military bands.

The 120th number is a reproduction in French of the Second Serbian Blue Book. It contains the text of the Note addressed by the Serbian Government to the Signatories of the Hague Conventions and calls their attention to the violations of the Law of Nations committed by the German, Austrian and Bulgarian authorities in the Serbian territories occupied by the troops of the Central Powers. Some 169 documents are attached as Appendices to this Note; they consist of extracts from newspapers and letters and of copies of affidavits bearing on the outrageous treatment meted out to the people of Serbia by the authorities temporarily in control of the destinies of this unfortunate country. A veritable reign of terror has existed in Serbia; the subjects of this State have been deprived of their rights and their property; and the invaders have also destroyed and pillaged the national literary and art treasures.

The Serbian Government has, in consequence, felt obliged once more to enter a protest against the misdoings of the Huns and their Allies and to appeal to the sentiments of justice and humanity of the civilized world, in the hope that an amelioration in the unhappy lot of the Serbian people may result therefrom.

The 122nd number is entitled *Les Commandements de la Patrie* and contains the text of an address given by Monsieur Paul Deschanel at the *Institut de France* in the name of the *Académie Française* at the public meeting of the latter held on the 25th October, 1916.

Monsieur Deschanel in this address tells his audience that the essential duties of Frenchmen, the commandments of their motherland are: Remain united; know Germany better; cause France to be better known; never forget; be foreseeing.

He continues: "Let us listen to the sounds that are wafted from the trenches and the sepulchres of our dead; the sounds which come thence carry the note of deep affection. Never has the French nation been a more united family than at the present time. Frenchmen were following different roads, these have met at the summit of a mountain. There exists to-day the same devotion, the same ideal in all. The heroes facing death one and all recognize that as each of them makes his last great sacrifice on this earth, with the passing of his life, which is but a short-lived flame, there is lighted another flame and one which is immortal. And yet the enemy does not understand that what has appeared to be tearing us asunder is really that which has united us: the passion for Right."

Monsieur Deschanel states that he does not know whether the expression "class divisions" still retains the meaning which it conveyed to those who gave it birth; but, he points out, never before has the greatness of poverty and the duty of riches stood out more clearly than at the present time. There are those who have and there are those who deserve to have; it is these two that make up the patrimony of a people. The small white crosses which sprinkle the fields from the Marne to the Seille and from the sea to the Vosges, where the dead lie, are the emblems of equality; may they bring together those that are living!

Turning to the second of his commandments, Monsieur Deschanel asks: "Will the War, which has taught Frenchmen to know themselves

better, also teach them to understand Germany better? For two years past, a mass of literature has been poured forth to throw light on the present situation and what has led up to it—but this has come somewhat too late! At each new invasion, France has awoken out of a sleep and exclaimed: 'What! Is this Germany, the Germany of Schiller and of Goëthe!' The ignorance of peoples concerning the ideals of one another of necessity leads to misunderstandings; they might well, under such conditions, have been dwelling in different planets."

It is his environment on earth that forms the character of man. Prussia, it has been said by Monsieur Lavissee, is a German State situated beyond the frontiers of Germany. Being without frontiers herself, she has thought that in order to live she must be continually attacking others. Her motto has been: Increase or perish. The term *Prussia* has become synonymous with the word *Conquest*.

Monsieur Deschanel tells us that Germany, in order to save herself from anarchy, has placed herself under the tutelage of Prussia. Germany has been built up by Prussia; her unity, such as it is, has been brought about by war and cemented by conquest.

The doctrine which has the first place in German philosophy is that Germany is acting in the name of the Eternal One; she must exterminate all evil and she claims that to effect her purpose she herself may do evil in order that good may be the result. Every German philosopher and every German historian has added some new formula to this accepted doctrine of Germany. Fichte has said that the German is "*Allman*"; he thus proclaims the pre-eminence of the Teuton; Hegel has insisted that the State must be "venerated as a god" with the most absolute obedience; Treitschke has maintained that the highest duty to the State lies in the development of its power, even if this should involve the repudiation of treaty obligations; Nietzsche has advocated the use of brute force and has given birth to the idea of the "*Superman*"; Lamprecht has conjured up the vision of a State possessed with tentacles, a vision which has been subtly made use of by Delbrück in the new German Law regarding naturalization; generals from the period of Clausewitz to that of Von Bernhardt have preached to the German soldier that the more "frightfulness" he practises in war, the more humane will war become. With regard to these formulæ, Monsieur Deschanel exclaims: "What a formidable arsenal of sophisms!"

German historians are the principal politicians in the Empire. Whilst giving an account of the past of the nation, they have been inculcating lessons as to the future. "The German," says Monsieur Deschanel, "is a being wrapt up in history. He lives with his gods and with his ancestors. He flatters and exalts himself in virtue of their accomplishments. Hermann is as much to him as Hindenburg. Verdun is, in his eyes, the most important of French fortresses, because it acquired a recognized status by the Treaty which put an end to the Empire of Charlemagne. He is always seeking revenge for the deeds of Louis XIV. and Napoleon. He is for ever in conflict with the damned civilization of the Latins, that world of perdition!"

The campaign of 1870 was but a step in an elaborate process which had been completely worked out. In 1909, Kaiser Wilhelm II. is

reported to have said to Von Schlieffen, the general who was responsible for the plan of campaign on which the German moves of 1914 were based : " The Treaty of Frankfort is but a truce." There was really no secrecy as to the designs of the German military authorities ; the construction of purely strategic railways towards the Luxemburg and Belgian frontiers, the military service Laws of 1911, 1912, and 1913 voted by acclamation in the Reichstag and hundreds of books published on German aims told anyone, who was able to understand the meaning of acts and words, what it was that was brewing. Germany's preparations were completed betimes and a pretext for declaring war alone was wanting.

Shortly before the Austrian ultimatum was delivered at Belgrade, Theodore Schiemann had written : " In order to start a war against France, it is only necessary to let Austria loose on Serbia." Heed having been given to the promptings of Schiemann, the world has during the past two years and more witnessed the conduct, by the apostles of Kultur, of a war against combatants and non-combatants alike with such ferocity and cruelty as is not to be found recorded in the annals of military history of any previous age, however uncivilized it may have been.

To-day, in every quarter utterance is given to the phrase : *German militarism and the Prussian military caste must be destroyed*. But in spite of the ridicule and condemnation to which the privileges and abuses of this caste have been subjected in the Press, on the stage, in romance, aye even in the Reichstag, we all know, says Monsieur Deschanel, how the Zabern affair ended. It is felt in Germany that her army has been responsible for her independence ; it has been the guarantee for the power and wealth of the Empire. Germany is proud of her army and views it with deep affection ; she worships it as if it were a deity. Like unto the German Army is the Germany nation. In order to bring about a change in the former a complete reconstitution of the latter must first be effected.

Monsieur Deschanel proceeds to deal with the third of his commandments by pointing out that if it is necessary for Frenchmen to know Germany better, the more so is it necessary that they should cause France to be better known.

Bismarck has dared to refer to the sons of France as " an effete people " ; whilst William II., his master, has labelled them " a degenerate people." It is to the sons of the same France that has given the world a Pasteur, a Berthelot, a Henri Poincaré, a Renan and a Taine that these epithets have been applied. It is the sons of this same France who, in the interval between two great wars, have built up a Colonial Empire which ranks as the second in the globe. In spite of the calumnies and intrigues of her enemies France has risen to the requirements of the situation and has taken rank amongst the great Powers of the world. In every field of activity her sons have contributed to the progress of civilization. Contemporary Germany certainly claims to be supreme in the fields of science ; but the fact remains that Germans have proved themselves imitators rather than inventors. France has never had any reason to be envious of Germany ; she can claim as her own many of the most distinguished men in every branch of science, they have at all times at least taken the leading position in medicine, surgery and physiology.

The most recent inventions of our own times, namely wireless telegraphy, automobilism, aviation owe much to the fertile brains of the genius of France.

Monsieur Deschanel points out the part that the members of the *Institut de France* have played as *Ambassadors of Ideas* in connection with their visits to America, Great Britain, Russia, Italy, Switzerland, Roumania, Sweden, Norway and Denmark. They can, he urges, never be engaged on a more profitable task than that of causing peoples of foreign lands to know better France, her character, her customs, her family life, all that beauty of her Greco-Latin culture, which has given birth to the heroism and virtue of the French race.

Monsieur Deschanel in concluding this part of his subject remarks that in the course of preceding centuries mighty Empires have crumbled away, one by one, since they were unable to bear the burden of their greatness. It is this fact that provides the assurance that the Public Right of Europe will be once more avenged by just retribution being meted out to the disturber of the peace of the old world. Force is to Right what the body is to the mind ; life circulates in the body but it is the mind that governs.

This volume concludes with a few remarks on the duty of Frenchmen never to forget and the duty to be foreseeing. Monsieur Deschanel says: " For us, Frenchmen, the protection of our frontiers is the most important of all matters. So long as German Armies remain within a few days' march of Paris, as they have done for three and forty years, there can be no tranquility in the world. France has in the past too easily forgotten the tortures to which she has been subject each time the Vulture of mid-Europe has cast a shadow over her fair provinces. *Generosity* is the term which has been applied to this readiness to forgive and to forget. Nothing can be urged against generosity towards an honourable enemy, but in the Entente camps to-day, generosity towards those who have made the great sacrifice, and those who may yet make it, has to be most borne in mind, particularly in view of the methods adopted by the enemy of to-day to gain the advantage.

Monsieur Deschanel reminded his audience that 16 years earlier he had in the same hall uttered the following caution:—" Keep your eyes on the Balkans. Study the valley of the Vardar. A duel between the German and the Slav is impending. France will be drawn into the fray. Stand united, be prepared ! " Continuing, he proceeds: " A people whose military spirit is on the decline is as good as condemned to death. Certainly, against Germany we will continue to defend arbitration ; could it but have avoided a war, it would have been a precious institution ; but it presupposes a sanction, that of force. A force which all those who are not willing to submit to the yoke must put their shoulders to the wheel to organize."

Germany has been in the habit of annually celebrating Sedan Day. Let France, says Monsieur Deschanel, celebrate in future the 4th August, that memorable day on which her children unitedly set their seals to a deed of great import. Let them do this in memory of the immortal meetings on the Marne and at Verdun. To forget would be a crime. But, France never will and never can forget.

W. A. J. O'MEARA.

SPONS' ELECTRICAL POCKET-BOOK.

By WALTER H. MOLESWORTH, M.I.E.E.—(Published by E. and F. N. Spon, Ltd. 6s. net).

In a short Preface the author tells us that his book is written for practical engineers who may seek for general information, etc., on electrical subjects, and at the same time he further defines the scope of the volume under review by pointing out that it does not include matters more particularly pertaining to telegraphy, telephony and special branches of electricity.

Compilers of books of reference of the class under review frequently appear to experience considerable difficulty in deciding what information they shall include in and what exclude from their works with the consequence that *pocket-books* so-called often do not comply with the designation their authors apply to them. The author of the work under review has been able to strike the happy mean and has thereby provided an extremely portable handbook.

The pocket-book under review contains, *inter alia*, tables giving British and foreign weights and measures, logarithms, trigonometrical formulas, graphic and international symbols (the text being in English, Italian and French), useful information relating to the heating of air and of water by electricity, tables relating to the resistance and carrying capacity of wires, weight and calculated size of conductors (all systems), systems of transmission, cost of same, poles, etc., for transmission lines, testing apparatus and methods of use, continuous current circuits and machinery, calculation of corona and corona losses, etc., electrical data in relation to alternating current circuits, alternating current machinery, generation costs, etc., primary batteries, stationary accumulators and accumulators for vehicles, electric furnaces, illumination of streets, etc., incandescent and arc lamps, data relating to electric traction and the costs of various systems, including tramways, trackless and other road motor vehicles and railways.

The "B.O.T." Regulations relating to overhead lines, and those relating to tramways and light railways are given in the pocket-book *in extenso*, as also are the guard wire regulations for the protection of the Postmaster-General's plant and the I.E.E. Wiring Rules, 1916. The pocket-book further contains a useful list of the laws and regulations in force relating to electric lighting, etc., and the names and addresses of publishers and booksellers where the Acts of Parliament and other publications referred to can be readily obtained. The information contained in the volume is up to date and from the brief summary of the synopsis of its contents given above it will be evident that all who have to deal with practical problems connected with the transmission of electrical energy and with the utilization of this form of energy for lighting, traction and electro-chemical purposes will find much that is useful in the pocket-book to assist them in their daily avocations.

NOTICE OF MAGAZINE.

REVUE MILITAIRE SUISSE.

No. 2.—February, 1917.

ON CAVALRY.

The *Revue* article is illustrated with Sketch Maps of Belgium and of Northern France.

In an editorial note it is stated that the following works have been drawn upon for information :—

La guerre sur le front occidental. By J. Reinach.

La guerre au jour le jour. By Lieut.-Colonel Rousset.

La grande guerre. French Official Communiqués.

L'action de l'armée belge. Belgian Official Account (*vide R.E. Journal* for November, 1915).

3,000 kilometer mit der Garde Kavallerie Division. By Dr. Vogel (Army Chaplain).

Histoire illustrée de la guerre de 1914. By Gabriel Hanotaux.

The author of the *Revue* article refers to the difficulties that all who desire to make a contribution to the history of the Great War experience at the present time, owing to the absence of positive and absolutely reliable information concerning the major incidents of the Campaign now in progress; in consequence, he does not pretend to draw any definite and precise conclusions concerning the part played by cavalry in the present Conflict of Arms on the Continent of Europe. His object in writing at the present juncture is to dispel the legend concerning the "bankruptcy of cavalry," a legend that finds currency in some quarters.

It is stated that in spite of the meagreness of the information which is available, it can nevertheless be definitely claimed that whenever cavalry has been employed in the Great War it has accomplished all that was ever expected of it.

At the time that the present War broke out many important and interesting questions affecting the employment of cavalry were on the tapis. The question was being discussed, for instance, whether in a Continental Campaign great raids would be carried out by cavalry corps, accompanied by cyclists and specially equipped technical troops, or whether cavalry would find it necessary to operate within easy distance of infantry support.

Again, in connection with cavalry reconnaissances, the question was still being debated whether the employment of complete squadrons or that of patrols was likely to achieve the best results. It was further an open question whether reconnoitring parties could be pushed to

great distances from their main bodies, as in 1870, or whether the sphere of their activity would be more confined.

In equal doubt was the question whether cavalry would be able to deliver an effective charge on a modern battlefield.

To each of the questions stated above an answer can be found in the records relating to the main incidents of the War; such answers may not be such as to allow a final opinion to be formed on the subject, but the information available is sufficiently complete to remove many of the doubts which troubled cavalry leaders. Raids, on a large scale, have been conducted in this War, for example, by cavalry under General Sordet in Belgium and by German cavalry in the Russian Theatre of War. Cavalry has, at times, been employed in the Western and Eastern Theatres considerably in advance of main armies, and, at times, it has operated within close supporting distance of infantry. This War has also shown that the days of the active intervention of cavalry on the battlefield have not yet entirely passed away. Numerous cavalry charges have taken place, as for example those on the Marne; further, Broussilof's Cavalry has been employed in pursuit of a retreating enemy under conditions which the most ardent cavalryman did not dare to dream of as a possibility. Finally, dismounted action by cavalry has been almost a matter of daily experience.

The author of the *Revue* article examines in some detail the part played by the 2nd and 4th Divisions of Von der Marwitz's Cavalry Corps. These divisions operated in advance of the right wing of the German Army which invaded Belgium; they crossed the frontier east of Gemmenich on the 4th August, 1914, and advanced on Visé with the object of forcing a passage across the Meuse there. They found that the bridge at Visé had been destroyed and that a battalion of the 12th Belgian Infantry Regiment had taken up a position to oppose the passage of the river at this point. The *terrain* being favourable this small infantry force was able to hold up the German cavalry. However, a brigade of Hussars was quickly sent to Lixhé, below Visé, and effected a crossing by the ford at this place. This manoeuvre on the part of the German cavalry not only turned the left flank of the force guarding the passage at Visé, but also practically opened the way for cavalry reconnoitring parties directed on Antwerp and Brussels. The Germans were soon in possession of both Lixhé and Visé; the river was quickly bridged at both these places and German columns were pushed across with the object of cutting off the Belgian Army, in position on the Gette, from Antwerp, its base.

On the 4th August, 1914, German infantry advanced guards were within easy supporting distance of the 2nd and 4th Cavalry Divisions. These divisions reached Visé at midday, and at 4 p.m. the infantry vanguards of five different German Army Corps had reached the line Bombaye-Herve-Remouchamps. Bombaye and Herve are respectively 3 and 6 miles from the Meuse. The short distance which separated the cavalry from the infantry was in this instance naturally due to the proximity of the Meuse to the German frontier in this neighbourhood.

On the same day (*i.e.* 4th August, 1914) the 9th Division, also be-

longing to Von der Marwitz's Cavalry Corps, crossed the frontier, probably in the neighbourhood of Malmedy. After passing the Salm, between Stavelot and Vieil-Salm, it was directed on Marche (west of the Ourthe), reaching this place on the 6th August. This division was probably intended to cover the concentration, in the neighbourhood of St. Vith, of the 3rd and 4th German Armies, and then to act as a screen to the westward of the troops engaged in the attack on Liège. It is probable that it was some patrols of this division that came into contact with Belgian Lancers at Plaineveau on the 5th August.

On the 14th August, the 1st (German) Cavalry Corps (Guards and 5th Divisions) arrived in the region south of Liège; the 9th Cavalry Division, being no longer required where it was, crossed the Meuse and joined the 4th Cavalry Division in the region Gembloux-Wavre, co-operating with it till the 18th *idem*.

By the 6th August, the concentration of the Belgian Army had been effected in the quadrilateral Tirlemont-Louvain-Wavre-Perwez, and on this date it was holding the line of the Gette; at the same time the 3rd (Belgian) Division was retreating from Liège on the river last named. The Germans had by the 18th *idem* collected 11 Army Corps in front of the Belgian Army, being particularly strong on the latter's flanks.

The German cavalry formed an almost impenetrable screen to the Army Corps referred to above and overlapped the flanks of the Belgian position. Owing to its numerical superiority this cavalry force was able to carry out the task allotted to it with the greatest ease, although the first attempts of the German 2nd and 4th Cavalry Divisions and a couple of battalions of Chasseurs to outflank the left of the Belgian Army on the Gette met with a check—a Belgian Cavalry Division, consisting of 2,400 sabres, 400 cyclists and 12 guns, on the 12th August held up a German force composed of 4,000 sabres, 2,000 rifles and 18 guns at Haelen. After this check, some change seems to have taken place in the rôle assigned to the German 4th Cavalry Division, for mention is made of its presence in the vicinity of Gembloux and Wavre on the 16th *idem*, where it had linked up with the German 9th Cavalry Division. Up to the 18th *idem* cavalry skirmishes took place in the region last mentioned, the purpose of which is not yet clear. It is probable that the task assigned to the two German Cavalry Divisions in question was to cover the advance of the German III., VII. and X. Army Corps which, having crossed the Meuse between Liège and Huy, was marching on to the line Jodoigne-Namur. It was at this period that the French and German cavalry came into collision near Perwez, when the former had to give way.

On the 18th August the German cavalry took an active part in the fight at Tirlemont, capturing two field pieces and two machine guns. The date last mentioned was a critical one for the Belgian Army which, being hard pressed on its front and flanks by a force much superior to it in numbers, was obliged to withdraw from the line of the Gette. Three German Army Corps were, at this time, advancing against the Belgian left between Diest and Tirlemont; the right of these Army Corps was covered by the German 2nd Cavalry Division then marching westwards between the Grande Nethe and the Demer. The presence

of patrols of this cavalry division at Aerschot (N. of Louvain), on the evening of the 19th *idem* had come to the knowledge of the Belgian General Staff.

It was the serious danger arising from the presence of this German force, threatening as it did to cut off the Belgians from Antwerp, that led to the retirement of the Belgian Army first to the Dyle and later on Antwerp.

During this phase of the War the German 9th Cavalry Division followed the retreating Belgians; advancing *viâ* Ottignies on Brussels, it passed through the latter city on the 20th *idem* and without halting there proceeded westward.

The German 2nd Cavalry Division seems to have acted throughout as a flank guard on the extreme right, covering the advance of the German I. Army on Brussels; it advanced directly on Ostend, whence the whole or a part of it was deflected in a south-westerly direction. It reached Alost on the 21st August. There is no trace of the independent movements of the German 4th Cavalry Division at this time: it was perhaps co-operating with the 9th Cavalry Division, to which the task had been allotted of covering the front of the German I. Army. At the time that the events to which reference has been made were taking place a considerable German cavalry force appeared at Condroz, south of Liège; it proved to be the 1st Cavalry Corps under Von Richthofen, consisting of the Guards and 5th Cavalry Divisions.

The order of battle of the German Guards Cavalry Division is given in the *Revue* article.

The 1st Cavalry Division, amounting to 10,000 sabres, had the duty assigned to it of traversing the Ardennes, with the object of reconnoitring the line of the Meuse towards Dinant. It crossed the Eifel, without mishap, covering from 19 to 25 miles per diem, and reached Laroche on the 11th August. Two reconnoitring squadrons had been pushed from Ettlebrück, on the 8th *idem*, towards the line Dinant-Namur. Neither of these squadrons appears to have succeeded in accomplishing the task assigned to it: one of them did not get beyond Rochefort, south of Marche. Both these squadrons, which were reinforced by half a company of cyclists, remained in telegraphic communication with their main body. Numerous patrols were pushed forward by these squadrons and these came into contact with French patrols sent out by Sordet's Cavalry Corps which had arrived on the Ourthe on the 7th or 8th *idem*.

In order to ascertain what was taking place on the line Namur-Givet and probably also to clear the way for the advance of the XII. (Saxon) Army Corps, the German cavalry undertook a reconnaissance in force towards Dinant on the 15th *idem*. After a temporary success the German cavalry was thrown back by troops of the French 1st Army Corps, which had just arrived in the neighbourhood of Dinant. This cavalry retired along the right bank of the river and was several times engaged, between the 16th and 19th *idem*, in the neighbourhood of Sovet, the object of the engagements being to clear up the situation.

On the date last named Von Richthofen decided to abandon his attack

on Dinant. The XII. (Saxon) Army Corps had in the meantime arrived on the scene and entered the fighting line.

Therefore it may be said that the German cavalry on both flanks, at Haelen and at Dinant, simultaneously met with checks (on the 12th and 15th August).

The author of the *Revue* article points out that the attack of the German cavalry on the Meuse was an enterprise of considerable magnitude; that it did not succeed is not surprising, for it is to be remembered that it is always a difficult task for troops, however strong in numbers, to force the passage of a river line presenting strong tactical features and defended by a large force of all arms.

The check met with by Von der Marwitz's Cavalry on the right of the German advance is less easily explained. The author of the *Revue* article suggests that the Germans, if instead of wasting time at Haelen when they found that they could not brush aside the Belgians met with there on the 12th August, had quickly decided to make use of the mobility possessed by a mounted force and had made a wide sweeping movement on Zelk, then but feebly defended, they might have met with considerable success.

After leaving the neighbourhood of Dinant Von Richthofen's Corps received orders to cover the left flank of the XI. (Saxon) Army Corps during its march on Namur. It moved *via* Brabant and Huy and, passing to the north of Namur, reached Charleroi on the 23rd August, just as the fighting was ending there. It was thereupon ordered to maintain connection between the German VII. and XI. Army Corps.

During the progress of the Battle of Charleroi five German Cavalry Divisions were north of the line of the Sambre and of the Meuse: as follows:—

2nd Division on the right bank of the Dendre, reconnoitring towards Lille; 4th and 9th Divisions in the neighbourhood of Tournai and Condé, on the Scheldt; the Guards and 5th Divisions, somewhat to the south and in rear of the 4th and 9th Divisions.

On the 24th August, the advanced parties of these divisions were on the line Pitthen (N. of Courtrai), Tourcoing, Lannoy and thence southward on Lille as far as the Douai region. Little information is available concerning the movements of these divisions after the date mentioned, except that it is known that the greater part of Von der Marwitz's Corps was on the 25th *idem* in the Cambrai region.

At the same time Von Richthofen's Corps crossed the French frontier at Sars-Potteries.

A period of great promise for the German cavalry appeared to have arrived. The enemy beaten at Mons and Charleroi was retiring southwards. Now was the time for the cavalry to harass the enemy during his retreat.

Von der Marwitz's Corps remained on the German right wing and pushed forward from Cambrai on Marcoing, reaching the latter place on the 26th August. Thence it reconnoitred towards Combles and Peronne. On the 29th *idem* it was at Albert and on the day following near Roye. It will thus be seen that this Corps during the period in question was covering the front and right flank of the German II. Army Corps

which formed the right wing of the I. Army. The German II. Army Corps had not taken part in the Battle of Mons ; it marched *viâ* Condé on Cambrai and on reaching the line Bapaume-Peronne, on the 28th August, came at once into collision with the French 7th Army Corps, which had been brought by rail from Alsace to form a new French army. The French Corps was compelled to withdraw to the southward.

On the night of the 31st August—1st September, the cavalry with the German I. Army marched through the Forest of Compeigne in two columns. Early on the morning of the 1st September it came into collision with the British rear-guards on the southern borders of the forest. The German 4th Cavalry Division was on this occasion somewhat roughly handled by the British troops ; it lost half its artillery and was so shaken that on the day following it was not able to take part in the engagement near Senlis in which the German 2nd and 9th Cavalry Divisions participated with the leading troops of the German II. and IV. Army Corps. The 3rd September was spent by the Germans in reorganizing units, in shoeing horses, etc.

On the 4th *idem* the 2nd and 9th Cavalry Divisions took part in the wheel of the German right wing to the south-east, which caused Von Kluck's Army to be directed on to the Marne ; they reached Ferté-sous-Jouarre that evening. The 4th Cavalry Corps had apparently not yet recovered sufficiently from the mauling it received on the 1st September to take part in further active operations ; it was relegated to form the flank guard of the German IV. Reserve Army Corps, at that time just north of Meaux.

On the 5th September the German 2nd and 9th Cavalry Divisions continued their southward march and, after passing Coulommiers, were heading for Provins ; however, at midday, an order arrived directing them to halt. They probably passed the night at Coulommiers, for on the morning of the 6th *idem* they were engaged in this neighbourhood.

The Battle of the Marne was about to begin.

Von der Marwitz's Corps was abreast of Von Richthofen's Corps and operated on its left. To it had been assigned the task of pursuing the British troops in their retreat to the line Valenciennes-Maubeuge. During the pursuit this cavalry had daily brushes with the British rear-guards. At Marbais it took 100 prisoners ; the Chief of the Staff of the Corps was killed at this place. Patrols varying from a dozen men to a troop were constantly employed, at great distances from their main bodies, by this corps.

On the 28th August this Corps came into collision with the French 10th Territorial Regiment at Urvillers and near St. Quentin, which had only just arrived on the scene. The Territorials seem to have been roughly handled by the Guards Cavalry Division which, it is said, captured a large number of French prisoners on this occasion. Reinforcements rapidly came to the assistance of the French Territorials. A British squadron of Hussars drove back a German squadron ; but the Anglo-French force was compelled to retire on Hurlu. This German cavalry captured Golancourt (S. of Ham) and forced the British to continue their retreat ; the latter had intended to make a stand at Guiscard.

One German squadron was now sent forward to reconnoitre the lines of the Oise and the Aisne with the object of selecting points at which these rivers should be crossed.

On the 30th August Von Richthofen's Corps arrived at Noyon. The patrols sent forward by it had been unable to obtain the desired information. In consequence, the Guard-Jägers and a part of the 5th Cavalry Division were pushed forward; cyclists being specially detailed to force the passage of the river. The German patrols ascertained that the town was not defended and also that the Bailly Bridge was intact. This Corps then crossed the river, part at Noyon and part at Ribécourt, and on the same day continued its march, being directed on Soissons. On this date an officer's patrol succeeded in doing considerable damage to the Soissons-Paris railway.

The German cavalry had received orders for the 1st September directing a reconnaissance towards Château-Thierry. It was held up for a time by the stubborn resistance made by French troops holding Soissons; the French were, however, finally forced out of the town by the fire of the German artillery. They retreated southwards and were pursued by the German cavalry which reached Branges, about 8 miles S. of Soissons. An engagement of short duration took place with a French rear-guard near Fresnes (S. of La Fère), on the following morning; soon after it had ended an order reached this cavalry from Von Bülow to cross the Marne near Jaulgonne. This move was successfully carried out; the river being crossed after a short dismounted action on the part of the advanced guard of the German cavalry.

On the 4th September Von Richthofen's Corps should have marched on Montmirail, but it could not do so as the roads were blocked by troops of the German VII. and IX. Army Corps advancing southwards by forced marches. The German I. Army met with resistance at Cambrai on the 26th August; at Peronne and other places to the south of Bapaume on the 28th *idem*; Lanrezac's Army made an attempt at Guise and at St. Quentin to hold up the march of the German X. Army Corps, but the Germans continued to make rapid progress and were much assisted by the vigorous attacks of their cavalry on the enemies' rear-guards. The Germans pushed on from the Aisne to the Marne. The German cavalry moved across country and reached the neighbourhood of Vieils Maisons, some 5 miles south of Château-Thierry; it was now abreast of the leading troops of the German II. Army and on their right. On the 5th September Von Richthofen's Corps outdistanced the German II. Army, and reached the region south of La Ferté-Gaucher on the Grand Morin and had the German IV. and III. Army Corps (belonging to Von Kluck's Army) on its flanks. The Guards Cavalry Division was astride the road to Provins and the 5th Cavalry Division was in its right; the two divisions occupying a front of 3 miles. This cavalry Corps had not experienced any serious difficulties on its southward march. As a rule as soon as its artillery came into action against the enemy's rear guards, they began to continue their retreat. This cavalry was also closely followed by the German infantry. Although the task was not difficult the cavalry, says the author of the *Revue* article, played their part well.

The cavalry with the German I. and II. Armies had opened the way for the infantry by continually treading on the heels of the retreating enemy. The passages on the Aisne, on the Oise, on the Marne and on the Petit and the Grand Morin were always seized in good time, owing to the bold handling of the cavalry advanced guards. Where bridges had been destroyed by the enemy the cavalry pioneers restored communication with rapidity, as, for example, at Noyon.

The reconnaissance duties allotted to the cavalry were also well executed. The cavalry covered on an average from 29 to 25 miles per diem; considering the amount of fighting which had to be done by it, there is little to complain of as regards the rapidity of its advance. It was at all times in a fit condition to perform its duties on the battlefield; the horses though tired were never exhausted and the *morale* of the troopers was excellent.

The losses suffered by the cavalry were nothing extraordinary. The Germans attribute the relative smallness of the casualties suffered by their cavalry to the bad marksmanship of their enemies.

The tactics employed by the Germans to turn the enemy out of positions held by them consisted in sending forward battalions of Chasseurs for the frontal attack, supported by dismounted troopers on each flank, whilst at the same time mounted troops attempted a wide turning movement, the artillery being at the same time employed to shake the *morale* of the defenders.

This method of attack always resulted, it is said, in large numbers of prisoners being taken by the German cavalry. The cavalry advanced guards, it should be noted, were generally accompanied by cyclists and machine guns.

French and Belgian reports make frequent references to the transport of German infantry by motor-cars, which was thus able to keep up with the cavalry; the German accounts are, however, silent on this point.—(*To be continued*).

TSING-TAO.

The *Revue* article, which is illustrated by a sketch-map of Tsing-Tao and vicinity, deals with the Japanese operations of 1914 against the German troops in the Shantung Peninsula. The circumstances under which Germany acquired a commercial Base, in 1897, in the Far East, owing to the murder of two German missionaries by Chinamen, is briefly touched upon. By the Treaty of 6th March, 1898, Germany obtained from China a 99-years lease of the territory at the entrance to the Gulf of Kiao-Chow, and of the islands and waters of this Gulf; she also secured the exclusive right to build railways and to work the mines in the Shantung Province. Kiao-Chow, the Capital of this Province, was not included in the lease; in consequence the Germans converted Tsing-Tao, a fishing village, situated on a peninsula north of the entrance to the Gulf, into the Capital of their Concession. This village soon developed into an important town, half German and half Chinese. In 1914 its population was 40,000 souls; it possessed a University, a Chamber of Commerce, many hotels and villas. Indeed, it had, by the

year last mentioned, already become an important commercial and industrial town, and served as a seaside resort for Americans and rich Chinese. When the European War broke out Tsing-Tao was full of visitors, but as soon as the mobilization was ordered in the first days of August, 1914, the visitors, except the Chinese, fled. Their places were taken by German reservists who flocked to the place from China and Japan; at the same time, the German troops at Pekin and Tientsin were also withdrawn to the Shantung Peninsula.

The German population at Tsing-Tao felt safe, as the fortifications at this place were considered to be sufficiently strong to hold out for the period of the War against any fleet which either Great Britain or Russia might detach for operations against Germany's Chinese Colony—it was assumed that the War would be of short duration. From the date of the declaration of war, thousands of Chinese coolies were employed to strengthen the German defences on the peninsula. It was expected that Japan would assume a complacent attitude towards Germany.

Great was the consternation therefore when, on the 16th August, 1914, the Japanese Government handed the German Ambassador an ultimatum demanding:—

(i.). The immediate withdrawal or disarmament of German ships of war in Chinese and Japanese waters and (ii.) the unconditional surrender to Japan of the leased territory held by Germany from China.

As rats desert a sinking ship, so did the Chinese desert their Teutonic masters, except in the case of a few loyal employés. The Germans now probably realized that their position was an almost hopeless one; the Governor of Tsing-Tao had but 5,000 men under his command.

No reply was sent to the Japanese ultimatum; a state of war between Japan and Germany came into existence on the 23rd August. On the 27th *idem* Admiral Kato declared a blockade against the Germans. At the beginning of September, a Japanese Army Corps disembarked on the Shantung Peninsula and laid siege to Tsing-Tao, which capitulated on the 7th November. Events in Europe had so completely diverted attention to the fields of Flanders and Antwerp, that the operations in the Far East passed almost unnoticed. Details are given in the *Revue* article concerning the German defences on the Shantung Peninsula. The principal line of defence on the land side was situated from $1\frac{1}{4}$ to 2 miles from Tsing-Tao and consisted of five closed works connected by a continuous line of parapet.

The closed works were constructed for garrisons of from 200 to 300 men. They were provided with bomb-proof casemates, the overhead cover of which consisted of 6 ft. 6 in. of concrete and 3 ft. 3 in. of earth; each work was surrounded by a barbed-wire entanglement, of the type known as "Simplex" in the German Army, 33 ft. wide and 5 ft. high. The parapet connecting the closed works had a command of from 6 ft. to 6 ft. 6 in.; it was provided with loopholes and, at intervals, with shelters for 4 to 8 men apiece. The walls and roof of these shelters were constructed of concrete about 8 in. thick. A continuous line of obstacles was constructed in front of the whole length of this parapet.

A very large number of machine guns, electric-light projectors and other accessories had been provided for the defences of Tsing-Tao;

and in rear of certain sectors of defence a second line of trench works had also been constructed.

In proximity to the outskirts of the town and about $1\frac{1}{4}$ mile in rear of the parapets, etc., for the infantry, permanent batteries had been constructed on the three hills, named Iltis, Bismarck and Moltke; 11-in. howitzers and guns ranging from 4 in. to 8 in. calibre were mounted in these batteries. Emplacements for heavy artillery had also been constructed on the sea front; in some cases the guns were mounted *en barbette* protected by shields; in others they were protected by cupolas. Nine guns varying from 6 in. to 8.5 in. calibre were mounted in the two principal coast works.

The troops available for the defence of Tsing-Tao were as follows:—

	MEN.
3rd Batt. of Marine Infantry (5 companies) ..	1200
Detachment of Marines from Far Eastern Garri-	
sons (3 companies)	450
Marine Artillery (5 companies)	900
Field Artillery	136
Pioneers (1 company)	116
Reservists, Volunteers, etc.	1,200
Total	4,002

To the above figure should be added the 1,000 sailors who were on board the Austrian cruiser *Kaiserin Elisabeth*, the German gunboat *Jaguar* and torpedo-boat S. 90. These vessels were at Tsing-Tao at the time the Japanese ultimatum was handed to the German Ambassador.

All available German civilians at Tsing-Tao not in the ranks were mobilized for police and other emergency duties.

A German officer had arrived at Tsing-Tao with a monoplane, three days before the declaration of war by Japan, and was the only person available for carrying out reconnaissances at a distance.

The landing of the first of the Japanese troops took place on the 2nd September, 1914, at Lung-Kou, on the northern shores of the Shantung Peninsula, some 125 miles distant from Tsing-Tao. This force first came into contact with the German troops on the 12th *idem*, at Tsimo, about 60 miles north of Tsing-Tao. The Japanese squadron blockading the Gulf of Kiao-Chow had some days previously bombarded Tsing-Tao and a Japanese airman had dropped a few bombs on the town. A Japanese torpedo-boat destroyer struck the reefs of Tschoucha-Tao, some 25 miles S. of Tsing-Tao, on the 31st August and the *Jaguar* sallied out of port to destroy the wrecked vessel.

The German marines and infantry had taken up their position in the works covering Tsing-Tao on the north-east, as soon as war was declared; they took in hand the strengthening of the same, as far as they were able to do so. The Japanese occupied Tsimo on the 13th September, 1914; Kiao-Chow on the 14th *idem*; and Liuting (about 40 miles N. of Tsing-Tao) on the 15th *idem*; heavy rains and inundations had added to the difficulties of the march. As soon as the German patrols had been driven back in rear of their advanced positions, a Japanese force

of about 25,000 men were landed in Lao-Tschan Bay (about 80 miles N.E. of Tsing-Tao) ; the disembarkation was carried out with very little opposition.

The Japanese left, which advanced along the hilly ground skirting the coast, was supported by the fire of a Japanese squadron and made more rapid progress than the right wing which came under the fire of the Austro-German vessels in the Gulf of Kiao-Chow.

By the 18th September, the German troops had all been withdrawn to the line Kaiser-Stuhl-Litsun-Tsangkou (about 20 miles from Tsing-Tao). They were gradually forced back by the Japanese and by the 28th *idem* had been practically driven back into their permanent defences covering Tsing-Tao. The Japanese troops effected their purpose without suffering any considerable casualties.

A British battalion was landed in Lao-Tschan Bay on the 23rd September ; it arrived too late on the scene to take part in the operations referred to above.

During this time, British and Japanese ships bombarded the German batteries on hills Iltis and Bismarck ; but their fire does not appear to have been effective. The ships employed were old, nevertheless their armament compared favourably with that mounted in the German batteries.

The Japanese General Staff devoted the whole of the month of October to the preparations for the Siege of Tsing-Tao. Violent storms interfered with the construction of siege works and the landing of heavy artillery from the 12th *idem* and onwards. The Germans were also much inconvenienced by the weather and remained on the defensive after having unsuccessfully attempted a sortie with three companies on the evening of 2nd October. They were content to bombard the Japanese siege works during the daytime with their heavy artillery, their only airman assisting them in directing the fire of the guns. At night they lit up the ground with their projectors, etc., and occasionally swept the ground in front of their works with their machine guns. The Japanese worked exclusively in the night-time and rested during the day ; the British-Japanese squadron alone coming into action in the daytime, and then only at long ranges. Nevertheless, the *Triumph* was sunk by a lucky shot, a torpedo destroyer was lost during a fog and two minesweepers were blown up. In spite of these accidents the British and Japanese sailors managed to remove the German mines in the zone south of Scha-Tzy-Kou (30 to 35 miles eastward of Tsing-Tao) so as to permit the landing of troops and stores on the coast bordering this zone.

During the night of 17th—18th October the German S. 90 succeeded in torpedoing the Japanese cruiser *Takachiho* ; it then ran aground in Chinese waters.

Towards the end of October, the British and Japanese ships became more aggressive and from the 29th October to 1st November subjected the German coast defences to a violent bombardment. On the date last-mentioned, the German battery at Iltis was put out of action.

The weather then interfered with the operations of the fleet.

The general attack on the German land front began on the 31st

October ; the Japanese troops engaged numbered 37,700 men and the British 1,300 men. This force is said to have had 250 guns with it, including 11-in. and 12-in. howitzers.

During the first days of the siege, the fire of the Japanese siege guns was directed against the German batteries on the hills Iltis, Bismarck and Moltke. The guns in these batteries replied as best they could, but it was to little purpose.

On the 2nd November the *Kaiserin Elisabeth* was sunk ; her complement, being saved, reinforced the troops holding the defences.

The German works were gradually destroyed by the bombardments of the 3rd and 4th November ; during this period the Japanese infantry continued to gain ground and the British entered the German first line. On the 5th November, a violent counter-attack drove the British troops from the German works they had seized.

On the morning of the 6th November, the German aviator left Tsing-Tao with the colours of the 3rd Batt. Marine Infantry and succeeded in landing on Chinese territory. The defenders were now at the end of their resources. During the night of 6th—7th November a Japanese force made a lodgment in the German position and rapidly extended their hold on it to the right and left of the works they had seized. At 6 p.m. on the 7th November the Germans hoisted the white flag, having, in the meantime, sunk the *Jaguar* and destroyed her armament.

Tsing-Tao at once passed into the hands of the Japanese troops.

The author of the *Revue* article states that he is indebted to an article by Major Knox, 36th Sikhs, which appeared in the *Journal of the United Service Institution of India*, for a great part of his information relating to the Japanese operations against Tsing-Tao.

IMPRESSIONS FROM THE AUSTRO-HUNGARIAN FRONT.

V. The Fourth Battle of the Isonzo (12th November—5th December, 1915).

The article begun in the *Revue* for August, 1916 (*vide R.E. Journal* for November, 1916), is continued in the number under review ; in it are given the experiences of the writer of the article whilst he was with the Austrian 7th Army Corps in November, 1915.

A panoramic view of Mont San Michele and the Cormons Plain taken from the hill S. of San Grado Di Merna accompanies the text.

The fourth Battle of Isonzo was fought over exactly the same ground as the other battles of this name. The principal attacks were directed against the Tolmino and Goritz bridgeheads, Santa Luzia, Monte Sabotino, Podroga and the plateau of Doberdo.

The author of the *Revue* article expresses admiration for the perseverance and bravery shown by the Italian troops in surmounting the difficulties met with in their attacks on Mont San Michele.

The Italian heavy artillery had for three days (9th—12th November, 1915) vigorously bombarded the Austrian front extending from the point where the Vippacco flows into the Isonzo to San Martino, having an extent of nearly 2 miles. Between 8 and 9 a.m. on the 13th November the thunder of the guns increased in violence and the summit of Mont San Michele became enveloped in a reddish cloud. Artillery

barrages were laid by the Italians on the line of the Vallone and further in rear towards Lokvica and Oppachiasella.

At about 9 a.m. three to four Italian Divisions were sent forward against the Austrian defences on the slopes of Mont Michele. The attacking columns were broken by the Austrian fire before reaching their objective. The Italians had to retire; whilst they were doing so the roar of the battle increased towards San Martino and Monte Dei Sei Busi; the Austro-Hungarian Artillery was particularly active in this sector. But here also the Italians were not able to make progress.

It is stated that the Italian Artillery fire was extremely accurate; guns of various calibres from 6 in. to 15 in. are said to have been in use. The Austro-Hungarian Artillery was in action in emplacements without overhead cover, and was distributed in groups of a couple of guns; these guns were frequently moved from one position to another. It suffered very little loss as compared to the infantry. The Austrians had a number of 12-in. mortars, having a range of 6 miles, which they used singly close up to the fighting line; concrete platforms were provided for them. They were provided with mechanical transport and a contractor's tramway track was provided for bringing up the ammunition.

The next event of importance was the bombardment of St. Goritz by the Italians during the 21st and 22nd November, 1915. The civil population, for the most part, fled from this locality to Laibach and Trieste. The Austrian Artillery replied with vigour. Many villages were destroyed by artillery fire during this period. The battle continued without a moment's respite. The Italians fully realized that the capture of Mont San Michele would lead to the fall of Goritz, and therefore pushed their attack by night and by day.

NOTES AND NEWS.

Switzerland.—A special correspondent contributes an article relating to Swiss affairs. The changes in the commands of the Swiss Army Corps and Divisions carried out recently are referred to. Colonel Wildbolz has been appointed to the command of the 1st Army Corps, and Colonel Schiessle to that of the 2nd Army Corps; Colonel Audeoud remains in command of the 3rd Army Corps. Colonel Gertsch has succeeded to the command of the 3rd Division and Colonel Bridler to that of the 6th Division. Colonel Biberstein has recently been appointed Commandant of the Gothard Defences.

Announcements appear relating to the death of Colonel Meister, who at one time commanded the 6th Division, and of Eugene Fonjallaz, Councillor of State, who was for many years in charge of the Military Department of the Vaud.

The recent decree of the Federal Council ordering the mobilization of the 2nd, 4th and 5th Divisions is referred to. It is stated that *since Germany has officially announced her intention of employing every means possible for the prosecution of the War and definitely stated that she has no scruples as to the lengths she will go in this matter* no one in Switzerland would be satisfied to leave the protection of the Swiss frontier to a single brigade. After the mobilization of the three divisions in question,

the public will be easier in their minds; they would feel happier still to have six divisions on the frontier. The writer of the article says: "From the military point of view, it would be in our interest naturally best to mobilize our whole army and to maintain it on a war footing until the situation becomes clear, as was, in fact, done in 1914." He also considers that a mobilization of the Swiss Army would be a good thing from a political point of view, now that the United States of America has shown in which direction her rulers are prepared to exercise their influence.

International Affairs.—Colonel Feyler contributes an article relating to the blockade proclamation issued by Germany and the questions arising out of it as they affect Switzerland.

He points out that Germany's proclaimed intention of establishing a blockade against Neutrals, in order indirectly to get at her enemies, has rendered the position of Neutrals exceedingly acute; the blockade is an attempt to put intolerable limits on their sovereign rights.

So far as the invitation of President Wilson to the Neutral Powers, including Switzerland, to join with him in severing diplomatic relations with Germany is concerned, Colonel Feyler states that putting aside the great difference in the risks run by Switzerland and the United States of America in breaking with Germany, where, as it is pointed out, one State is within the immediate range of German guns and has a frontier protected from invasion only by an inconsiderable obstacle, such as the Rhine, and the other State has the protection of a broad ocean between it and its possible enemy, the difference in the fundamental policies of these two Neutral Powers must be given due consideration.

Switzerland is bound by the Declaration of Vienna to maintain *Perpetual Neutrality* and can take no political action in Europe in violation of this obligation. The United States of America has a free hand in the action she is at liberty to take.

Colonel Feyler next discusses whether the honour and dignity of Switzerland is affected by the German blockade declaration, and comes to the conclusion that they are affected. He considers that the protest sent by the Federal Council to Germany on the subject is drawn up in strictly correct language; the Federal Council take their stand on the solid ground of Sovereignty, such as is guaranteed by International Law to all nations alike; they make it clearly understood that the Swiss nation desires to remain faithful to its Treaty obligation of Neutrality; at the same time the Council expect the belligerents to respect the essential rights which Switzerland possesses as a Sovereign State.

INFORMATION.

An obituary notice relating to Capt. Chavannes, Deputy for Vevey, appears under the above heading. He joined the Swiss Army as a recruit in 1879, at the age of 19 years, and was gazetted Lieutenant in 1882 and Captain in the Carbineers in December, 1891. He was transferred to the Landsturm in the rank of Major in January, 1910, but by special request was allowed to retain his rank of Captain. He was a fine type of Swiss officer.

This number concludes with a *Bulletin Bibliographique*. A reference is made to the considerable amount of War literature which has been published in Europe. Short notices are given of some of the more prominent works issued recently.

SUPPLEMENT.

The first part of a supplement entitled *L'Occupation des Frontières par les Troupes Suisses en 1870—1871*, by Colonel Galiffe, is issued with the number of the *Revue* for February, 1917.

In an introductory notice it is stated that the present appears to be a favourable opportunity for placing the late Colonel Galiffe's work in the hands of the public; further, the publication of the work also enables an act of posthumous homage to be done to the memory of a distinguished officer.

The first part of this work is entitled *Préliminaires*.

Chapter I. is devoted to *The Measures taken by the Federal Government* and contains a very brief reference to the candidature of a Hohenzollern Prince, in 1870, to the Spanish throne and the guarantees demanded by Napoleon III. from the Prussian King, after the latter had approved of the withdrawal of the candidate, a member of the Prussian Royal House. This demand was utilized by Bismarck, as is well known, as the pretext for forcing on the war between Prussia and France.

The measures taken by the Federal Government with a view to ensuring respect for the Neutrality of Switzerland, guaranteed by the Treaty of 1815, are then shortly described in this Chapter. The main points of the Ordinance published by the Federal Government on the 18th July, 1870, relating to the maintenance of the Neutrality of the Swiss Republic are briefly set out.

Chapter II. provides particulars concerning *The Federal Army in 1870*. The military organization of the Confederation was at that time regulated by a Law of 8th May, 1850, which divided the Swiss population into three categories and imposed the following obligations on the male population :—

(i.). Service in the *Élite* for men between 20 and 34 years of age, up to a total of 3 per cent. of the population.

(ii.). Service in the *Reserve* on transfer from the *Élite* between the ages of 35 and 40 years, up to a total of 1½ per cent. of the population.

(iii.). Service in the *Landwehr* for all men below 44 years of age who had received military training and were capable of bearing arms. The *Landwehr* was a Cantonal organization, but the Federal Council had power to utilize it in an emergency.

Each category of troops was embodied in separate tactical units. The infantry received its training under the Military Departments of the Cantons, whilst the Central Authorities were directly responsible for the training of the Carbineers and technical troops. Details of the organization of the Swiss Army at this date are given in this Chapter.

On the 1st January, 1870, the Federal Army consisted of nine divisions, total strength 203,053 men, made up as follows :—

General Staff	..	..	..	..	..	805 men.
Elite	..	..	..	..	..	85,563 „
Reserve	..	..	..	..	..	50,146 „
Landwehr	..	..	..	..	..	66,539 „

In Chapter III. information is given concerning the *Points of Access across the Frontier and the Railway System on the Northern and Western Fronts*. It contains a useful summary of the topographical features of the frontier that are of importance from a military point of view.

The Second Part of this work is provided with an Introduction entitled *Les Opérations*. It is pointed out that when the Federal Council ordered the mobilization of five Swiss divisions in July, 1870, war had not actually been declared. It was naturally impossible to predict the course of events nor was it known whether the Southern States of Germany would espouse Prussia's cause. As soon as the early German successes had resulted in a withdrawal of the French Armies into the interior, and it became apparent that the danger of an invasion of Switzerland by the belligerents was remote, the Federal Council at once reduced the number of troops mobilized and provision alone was made by it for police duties on the frontier ; e.g. those dealing with deserters, refugees from belligerent territories, etc.

This period during which the Swiss Army was on the frontier can be divided into three distinct phases :—

- i. Period of demonstration, from middle of July to end of August, 1870.
- ii. Period of observation, from beginning of September to end of December, 1870.
- iii. Defensive Period, from first days of January, 1870, to end of February, 1871.

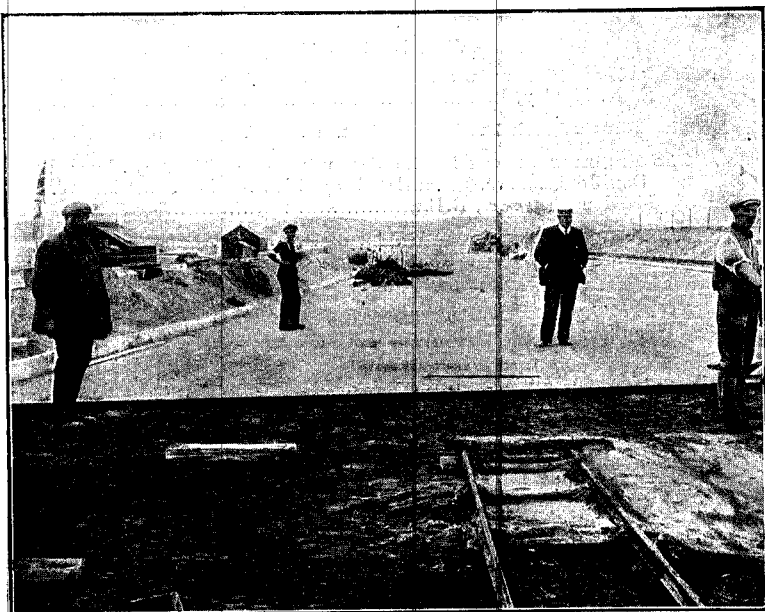
The next section of the work is entitled *Période Démonstrative*.

Chapter I. is devoted to *The Belligerents* and in it is furnished brief details of the mobilization of the French and German Armies, and the concentration of the French 7th Army Corps at Belfort, when the information of the German successes at Wissembourg, Wörth and Spicheren reached General Douay, its Commander.

Chapter II. entitled *In Switzerland* is begun in this part of the Supplement.

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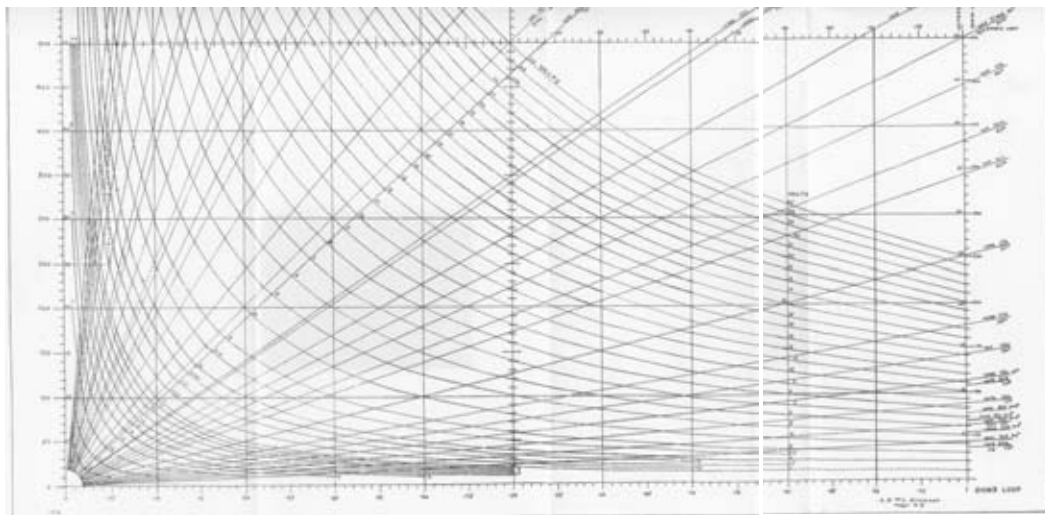
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